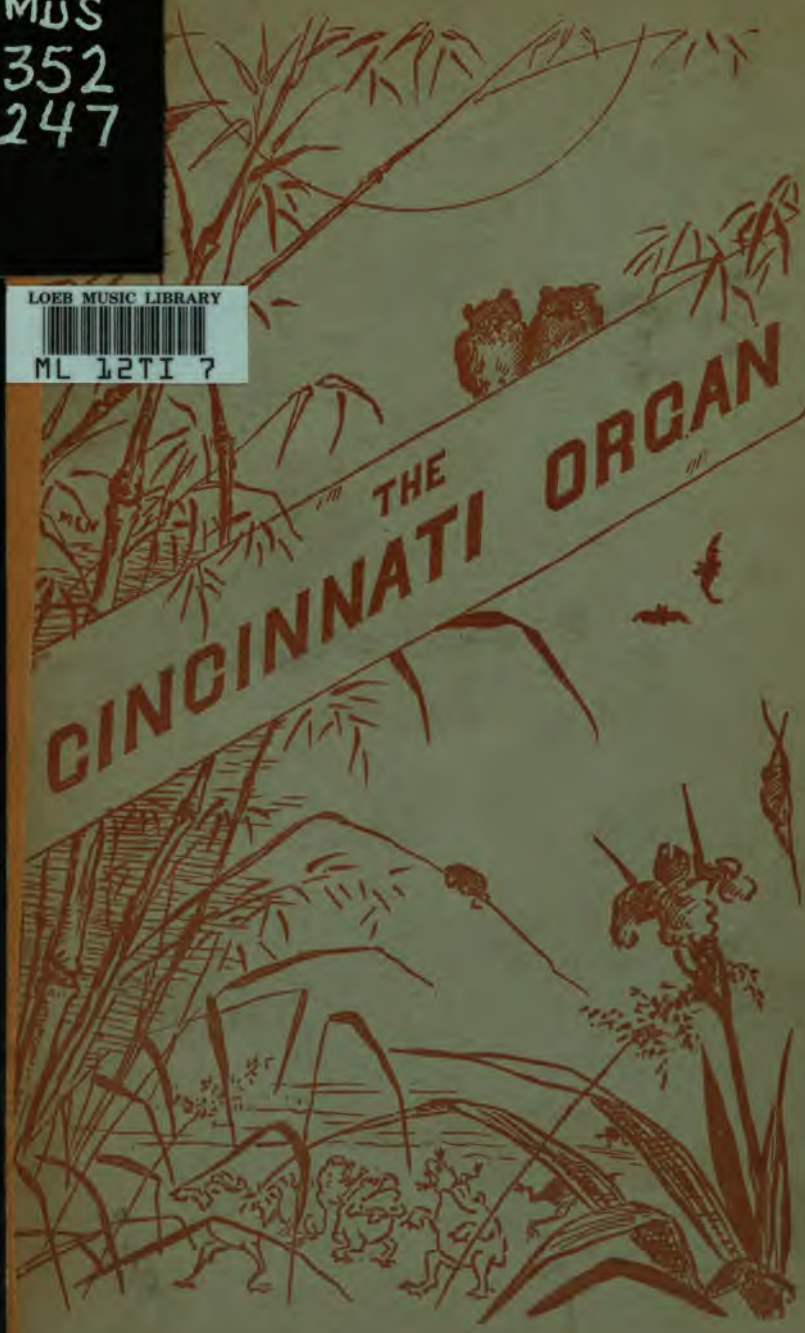
THE CINCINNATI ORGAN



THE

CINCINNATI ORGAN:

WITH A

BRIEF DESCRIPTION

OF THE

CINCINNATI MUSIC HALL.

WITH ILLUSTRATIONS.

EDITED BY

GEORGE WARD NICHOLS.

CINCINNATI:
ROBERT CLARKE & CO.
1878.

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THE CINCINNATI ORGAN.

CHAPTER I.

HOW THE CINCINNATI ORGAN CAME TO BE BUILT.

When it became certain that the Music Hall was to be erected, those interested in music and art culture felt that a great organ in the building was a necessity. Here was a large and beautiful auditorium, constructed in obedience to the laws of sound, with every regard paid to convenience, comfort, and safety. Here was a glorious temple within which to enshrine the king of instruments—

THE ORGAN.

Here was a perfect opportunity to provide music for the people, for the most eager, cultivated, critical ear, but also for the equally eager masses who, without knowing why, love music, and can not always afford to indulge the desire.

When the subject was proposed to Mr. R. R. Springer, whose splendid munificence has given to the world the Music Hall, that gentleman at once perceived the importance of such an acquisition, and headed the subscription list with a generous donation, which assured the success of the undertaking.

After an amount of money was raised sufficient for pur-

poses of incorporation, an association was formed which at once began negotiations for the purchase of a great organ. The plan has been, from first to last, to build one of the largest, but at all events one of the best organs in the world. To attain this desirable result, the managers invited proposals from all the great organ builders in this country. The competition was spirited, and tenaciously maintained.

The successful contestants were Messrs. E. & G. G. Hook & Hastings, of Boston. There were several propositions from eminent builders, which were very attractive. The choice fell upon Hook & Hastings for several reasons. These reasons combined promised the most satisfactory results. Not the least of these were the long established integrity of the house, the skill and thoroughness of their mechanism, and a fine artistic sense in their conception of what great organs should be.

It was a part of the contract that the organ should be erected and finished in the hall, on or before the first day of May, 1878, in order that it should be ready for use at the Musical Festival, which had its biennial celebration during that month.

The work of construction began at Boston, in May, 1877.

On the first day of February, 1878, a large part of the organ was in the hall, and in one week's time its foundation was laid.

DECORATION OF THE ORGAN.

While the musical part of this noble instrument had gone so far forward toward successful completion, a movement had begun among the art workers of Cincinnati, which expressed in a charming way their fine sense of the beautiful and their local patriotism. For several years this city has had art education in the public schools. It has also had a School of Design, whose method, teaching, and practice have produced high artistic results.

In the School of Design, there is a department of wood carving, taught by Mr. Ben Pitman. In this wood carving class were many women, the wives or daughters of citizens of Cincinnati. There was also in the city a private school in wood carving, conducted by Henry and William Fry, father and son. The students in this school were also women, residents for the most part of this city.

When it became publicly known that there was to be a grand organ placed in the new Music Hall, and that the screen was to be built at home, all these people—men and women, boys and girls—with whom life had become so much more beautiful and attractive by reason of their art studies, came quickly forward and said: "Let us make the designs; let us carve the panels, frames, freizes, capitals, and finials of the organ screen. We will work with hands and brains and heart, and offer the results of our labor as our contribution toward the people's organ."

This generous proffer was at once gladly accepted. In order that there should be no conflict in the general design for the screen, a committee from the managers was appointed, who supervised the designs. Meanwhile the important responsibility of making a general design for the architectural construction of the screen, and the labor of its actual construction, was placed in the hands of Robert Rogers, an artist and artisan in wood work. It was decided that the wood of the screen should be of wild cherry, one of the most beautiful of our native woods, and which, under a proper treatment with oil, and not varnished, assumes tints of color rivaling those of the richest mahogany.

In the course of a few months, in the early autumn of 1878 parts of the screen were in the workshops of the School of Design and in that of the Frys, and dextrous, busy hands were deftly fashioning the tough fibers of the wood into objects of exquisite grace and beauty.

These were admirable beginnings, producing prolific fruits, but greater things were to come; for the pride, enthusiasm, and genius of William Fry, the Ghiberti of American decorative art, became enlisted in the work, and several of the most important panels and freizes were confided to his masterly hand.

PRIZES OFFERED FOR THE BEST CARVING.

It was about this time that the benevolent heart of Mr. Springer again overflowed, and his fine artistic taste and judgment were displayed. He wrote a note to the secretary of the Organ Association, offering five hundred dollars in gold in ten premiums—of three premiums of one hundred dollars; two of fifty dollars; five of twenty dollars—for examples of design and wood carving in the organ which should be worthy of special mention, the competition to be confined exclusively to females.

In its proper place a list is given of those who have designed and carved for the organ, with a description of their work. But there have been special efforts, which may appropriately find record here. It ought to be mentioned that, when the distribution of the decoration of the organ was first made, all of that part between the two grand towers was assigned to the Frys and the pupils of their school. All of those parts of the organ outside, and including the towers were placed in charge of Mr. Pitman and his students.

The decoration, therefore, of these different divisions is mainly attributable to the gentlemen having them in charge. All of the carving above the belt, including the towers, is the work of the Frys. The enthusiasm, taste, and energy of Mr. Pitman have been of incalculable value to the successful completion of the serious task he assumed.

The ripe experience, the practical knowledge, the artistic

sense of the Frys, have produced in this organ carved work, which, it is no exaggeration to say, has never been excelled. The Frys can not be mentioned without calling special attention to Laura Fry, the daughter of William Fry. This young woman graduated from the drawing and design department of the School of Design, after three years' study. She is a fair example of how useful one may become who wishes to profit by art study. She made the larger part of the designs and working drawings of the ornamentation under charge of her father and grandfather.

When the spectator stands before this great organ, he will be attracted by the profuse and brilliant display of pipes. They are radiant with silver and gold, and chastely decorated here and there with bands and borders of rich arabesque ornamentation. This exquisite decoration in gold, silver, and with color is the work of Wm. H. Humphreys, assistant superintendent in the School of Design. To this gentleman, also, credit should be given for much excellent counsel with regard to the general decorations of the organ. His hand and eye, skilled in drawing, were brought into frequent use, and he is the author of the superb engraving which celebrates the fame of the great instrument.

THE TRUMPET FLOWER.

CHAPTER II.

DESCRIPTION OF THE ORGAN.

We will divide the description of the organ into two parts—

1. WHAT IS CONSTRUCTED FOR THE EYE.
2. WHAT IS MADE FOR THE EAR.

In a physical way these are separate existences, yet they are united by the finest sense of the beautiful, by the highest laws of art. Architecture and music are more allied, have a more intimate correspondence with each other than have their sister arts. If Amphion built the walls of Thebes to the music of his lyre, surely the envelope which enshrines these infinite harmonies has sprung into being in the service of music, obedient to its voice. All over the wonderful, radiant face of this screen, music appears in form. The hum of insects, the song of many birds, the rustling of the leaves, a thousand shapes of grace and beauty suggest those mysterious emotions of the heart and soul which are associated only with the divine, the spiritual power of music.

The organist is the visible link between these two arts of architecture and music. Let us take our position near where he sits, and from this point move here and there as may suit our convenience, studying and enjoying these exquisite poems in sculpture.

DECORATION.

To the right and left of the key-board are two small, narrow panels; one of these is a spray of wisteria; pendant,

and reaching forward, it shakes the morning dew from its leaves and clustering flowers. It bears the evidence of the refinement and delicacy of a woman's touch, and the feeling of one whose mind is attuned both to sculpture and music.

On the other side hangs a companion-piece, the Virginia creeper, which is also the work of a woman. Crisp and fresh are the leaves, gracefully bend the twigs and branches. Both of these panels are bordered by frames carved with artistic conventionalized forms.

Above these modest efforts there is a group of panels which should be treated together, although the subjects are different—EVENING, NOON, and MORNING.

EVENING is described by a flight of swallows, swiftly and silently descending from the sky, and circling in their aerial course. The crescent moon is setting in the west, its silver face partially obscured by bars of golden clouds.

MORNING also shows us a flight of birds, but they noisily wing their way upward, rejoicing in the strengthening rays of the rising sun.

NOON is depicted by a field of grasses, with flowers opening wide their fragrant bosoms, with butterflies hovering in the heat, with drone of bee, and insects hum.

Of this group Morning and Evening are the work of our great artist's hand, while Noon has found an admirable interpreter in a lady of rare culture and refinement.

On either side these charming panels rise two masterpieces of sculptural art. Of these it is faint praise to say that neither the Middle Ages, so fruitful in carvings, nor modern days, with all its culture, have produced such noble work. The trumpet-vine is a wonderful example where imitation ends just in time, and suggestion begins. One can see the rustling among the leaves, and hear this

"Light-winged Dryad of the trees
In some melodious plot,
Of beechen green and shadows numberless,
Singest of Summer in full-throated ease.

The passion-flower, which fills the other space, also gives with marvelous grace the motion of foliage. It never occurs to the beholder that this is stiff, hard wood, with difficulty fashioned into the desired shape. It has the texture of leaf and stem, the flexibility of foliage, the fragrance of the forest.

Above the pictures which have just been described are five arched top panels. Each of these is dedicated to a composer, and bears his name; and they are a part of a series of panels which extend across the whole face of the organ.

The names of the composers are written upon these panels, among floral offerings, which may perhaps have some significant correspondence to the person they celebrate.

In the center is Bach, crowned with immortal laurel. He is accompanied, on one side, by Beethoven. A branch of oak, with acorns half bursting from their cups, is thrown across a scroll, upon which is inscribed that glorious passage from the Ninth Symphony, known by all the world of music, "Oh, Joy! Bright Star," etc. Handel occupies the side of Bach to the left, his honored name standing boldly out from among the superbly modeled hawthorn leaves. To the right and left of these three panels, and surmounting the grand panels of the trumpet vine and passion flower, are Mozart and Mendelssohn. Mendelssohn is almost smothered in fragrant, full-flowing lilies, while Mozart is half hidden among the outstanding, glistening leaves of the ivy.

Three of these panels sprang from the fertile brain and magic fingers of our great carver; the fourth, Handel, is

the work of a lady from a neighboring city; the fifth, that of Mendelssohn, is the happy conception and superb execution of the daughter of William Fry, who inherits his fertile powers, as well as bears his name.

We now rise to the magnificent frieze, which, in three grand divisions, stretching from tower to tower, surmounts the forest of foliage. Only William Fry, whose genius has been exhibited in what has been described before, could have accomplished this crowning achievement. He has chosen the Honeysuckle for his sculpture, because of its luxuriant leafage and its tender associations. With what infinite charm has he expressed its wayward grace, its delicious fragrance! Who but he could have peopled it with flocks of birds, pouring forth their ecstacy of song!

In this brief description of the carved work of the central part of the organ, minor details must not be neglected. The borders of the frames of the panels are all handsomely cut, with arbitrary forms, offering, by the severity of their design, a varied and pleasing relief from the more realistic treatment of the remainder of the work. A quaint and charming conceit may be seen in the spandrils, where the opening buds of the primrose are made to suggest the diatonic scale; and our noble State of Ohio is not forgotten, for the capitals of the pillars between the panels bear the significant leaf of the Buckeye. These spandrils, with all their freshness and suggestiveness, come from the hand of women. The borders which inclose the panels are worked by the authors of the panels.

In the center of the organ facade, there is a group of pipes decorated with gold and silver bands. Above this group rises a massive cornice, which unites the flanking towers. In this cornice there is a frieze, eighteen feet in length, boldly carved, with wide-spreading, conventionalized leafy forms. Over the tops of the pipes, in the towers, there is

THE WISTERIA.

similar carved work, with four spandrils, boldly cut in simple, vigorous forms. Half way up the towers, there are bands which tie together the upright columns. These bands contain panels filled with rosettes, deeply cut and finely modeled. The severe simplicity of the designs, the bold carving and high relief of the upper part of the screen, is in marked, but harmonious, contrast to the elaboration and profuse ornamentation of the lower part, which comes more directly within the reach of the eye.

All the work we have just described is designed by that veteran artist, H. L. Fry, and executed in his atelier.

Mr. Ben Pitman has kindly contributed the following description of the work executed by the members of his class:

VOLUNTEER LADY DECORATORS.

"No sooner was it decided upon to erect an organ on a grand scale in the new Music Hall, than great enthusiasm was enkindled among the lady students of the School of Design to assist in worthily decorating so noble an instrument. More than one hundred ladies, who were or had been students of the carving classes, at once pledged their services, and the actual work commenced in September last. Many of these earnest art students have devoted the whole of their leisure time since the autumn to carving of various moldings, head pieces, panels, etc., that help to make up the immense area of the organ screen.

PANEL MOLDINGS.

Only the critical observer will be likely to appreciate so subordinate a feature as the panel moldings; but an examination will show much originality of treatment in design, as well as skill in cutting this portion of the organ's decoration. To make designs for such limited spaces as these moldings present, which shall be original, and at the same

time appropriate and beautiful, is a task which only an expert will rightly estimate It would have been easy to select and copy forms that have been employed in classic, gothic, or other styles of decoration; but such ornamental features have been vulgarized by endless repetitions and inappropriate use till they cease to interest us. They were therefore inadmissible here. The problem was to devise new lines of enrichment that should accord with the art traditions of the best periods of the past, and yet be appropriate to nineteenth century culture, and to the special use for which they are here intended. It was felt that our art work should be the expression of our needs and delight, and be as truly the product of American civilization as the best art of the past was the expression of the highest attained civilization of the periods in which it was first employed, or as the noble organ itself that was sought to be decorated was the product of our own construction, intelligence, and skill. The problem, we believe, has been successfully solved. The observer will note in these moldings, forms suggestive, while in no sense copies, of Egyptian, classic, romanesque, arabesque, Norman, and gothic design. With the exception of the dog-tooth moldings on the panels of the projecting towers, no two panels are decorated alike, and the variety that is presented is at once original, appropriate, and beautiful.

WAINSCOT PANELING.

The wainscot or dado paneling encircling the organ, and extending five feet above the base, is intended to present strong, vertical lines of decoration, for such only would be appropriate in this position. The subjects selected for ornamental treatment are, for the most part, reeds, rushes, bamboos, and other plant forms from which musical instruments have been made in times past. The Egyptian water lily or lotus, the symbol of upper Egypt; the papyrus, with

its tuft of thread-like inflorescence, the symbol of lower Egypt,—the land whence we derive the earliest specimens and the greatest variety of musical instruments—will be found among these panels in realistic as well as conventional treatment. The variety and suggestiveness of this portion of the organ screen will repay examination, for it is a style of enrichment singularly appropriate and effectively carried out.

COMPOSER'S PANELS.

The diagonal square panels containing the names of ten of the great composers that occupy positions on the towers, are striking and beautiful points of ornament. Each name has for a background some appropriate foliage or flower, suggestive of the composer, his nationality, or his style. The lettering, while preserving the mediæval type, which good usage has made essential for artistic inscriptions, is new in outline, and though highly ornamental, beauty is secured without a sacrifice of legibility. In the design of the background of the Wagner panel, the observer may trace the form of the treble clef, gracefully indicated in the arrangement of the thistle leaves. The design and execution of this panel reflect great credit upon the Misses Hattie and Mary Johnson.

The following are the names of the students by whom these panels were carved:

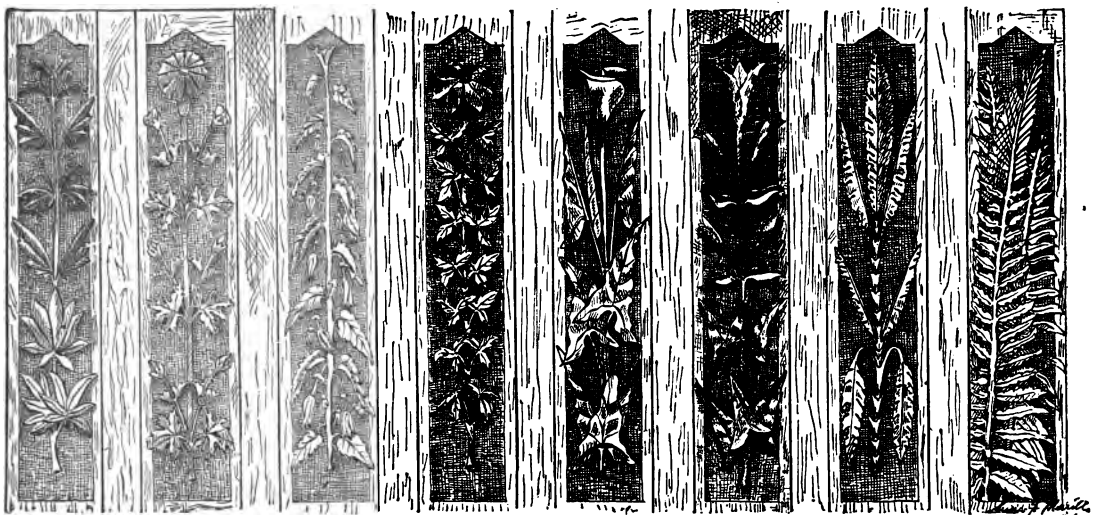
Composer.	Subject of decoration.	Artist.
Schumann	Rose	Miss Essie De Camp.
Schubert	Honeysuckle	Miss Annie Empson.
Wagner	Thistle	Misses Hattie and Mary Johnson.
Rossini	Grape	Miss Isora Collard.
Haydn	Morning Glory	Mrs. S. M. Barrett.
Scarlatti	Sycamore	Miss Emma F. Alexander.
Porpora	Beech	Miss Carrie L. Phipps.
Meyerbeer	Chestnut	Miss Lizzie R. Potter.
Cherubini	Fig	Mrs. M. E. Black.
Gluck	Acanthus	Miss Jennie N. Phillips.

THE LOZENGE PANELS.

The lozenge shaped panels on the wings of the screen, and on a line with the composer's names, are designed and cut with skill and vigor. Spring, summer, autumn, and winter,—never ending themes for poetry, song, or art,—are here represented. Spring, by the narcissus, carved by Miss Mamie Rice; summer, by the Ceylon aster, carved by Miss Abby Allen; autumn, by the grape vine, carved by Miss Julia Rice; winter, by the holly, carved by Miss Sallie B. Ehrman. Summer is repeated, in the tropical aster, differently and admirably rendered by Miss Fanny Y. Ward.

DIAPER PANELS.

Eight diaper panels, so called from the characteristic diapering employed for the decoration, will be noticed on the wings of the screen, immediately over the line of composers' panels. There is no repetition of rosettes in this line of decoration, and a usually quiet style of enrichment is thus made varied and interesting. The lady students who carved these panels are Miss Hattie D. Caldwell, Miss Adelaide Nourse, Mrs. Myra E. Kinsey, Mrs. B. M. Johnson, Miss Lottie E. Crofton, Miss Jennie F. Comstock, Miss Lida Elstun, and Miss Clara Grever."



PARTS OF THE DADO.

CHAPTER III.

WHY IT IS ONE OF THE GREATEST ORGANS IN THE WORLD.

The visitor to the Music Hall who for the first time looks upon this great organ, is naturally impressed with its size. It is fifty feet wide, thirty deep, and its pyramid of pipes rises sixty feet in the lofty hall. This is as large as two ordinary sized dwelling houses in city streets. It is spacious. Nothing like it exists anywhere in the world. Good reason is there for wonderment, and a sense of awe and majesty. But there would be very little satisfaction in saying that this is one of three or four of the largest organs in the world, if it could not also be asserted that it is one of the best. We believe it may be affirmed with perfect truth that there is no instrument in existence, either in America or Europe, which equals the Cincinnati organ. It possesses not only all the mechanical contrivances known to modern European instruments, but also many ingenious appliances, the cunning inventions of the builders, which serve to give power and efficiency to its vast and complicated machinery. Some of these improvements are described in the "scheme" of the organ, others are secrets of the discoverers, which may not be told. But the mechanical parts are of minor importance in the high estimation with which this glorious creation is to be held.

That part of the construction which is expressed only by the term "ARTISTIC," calls for our deep admiration, our enthusiastic acclaim. In these qualities a great organ is like other instruments. The violin, oboe, and horn have excellence and

value because of qualities outside those which are merely mechanical. These qualities in the organ are not easily described; they are its temperament; they can only be *felt*. They may be called "artistic." This great organ, then, possesses in a fine degree this higher condition, which has given to the Freyburg organ much of its celebrity. This artistic feeling is seen in the nice and broad balance of one part to the other; this harmonizing of separate divisions; but, more than all, the production of pure, resonant, musical tones. When one gazes upon the bewilderment of pipes, trackers, chests, bellows, and other objects, within the screen, the apparent confusion, the bigness of the thing would lead to the belief that one organ is much like another; yet the differences are so varied as to be perceptible to the most inexperienced observer. This organ is not approached by any we have ever heard in the firmness, volume, clearness, and sweetness of its tone. In its entire construction it is the culmination of musical and decorative art.

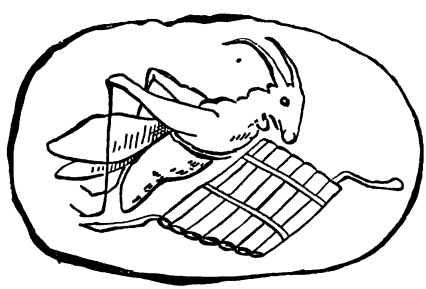
THE ILLUSTRATIONS.

The pride with which the people of this city look upon the organ-screen, may well be imagined, for its entire construction and adornment is a fair representation of the culture of the community. The conceptions of the designs, and their sculpture in wood, shows the exercise of artistic facilities, but a most charming and practical art has also been called into service in the translation of these beautiful conceits into another language—that of pictorial art. The illustrations which have been reproduced for this book by the photo-engraving process have been etched with the pen. They are contributions to this great public work by those who do not carve, but wished to be represented. Each of these drawings, the work of different artists, bears the individual character of its author.

These drawings are executed with vigor and delicacy. Several are the work of young women, and are full of freshness and poetic feeling. They are works of art. These artists are a decided credit to the School of Design of the Cincinnati University, for they are all pupils of that admirable institution.

THE SITUATION OF THE ORGAN.

It is seldom that the builder has the opportunity to place the organ in a proper position. He is necessarily restricted in space, and is obliged inconveniently to crowd the mechanism, so as to confuse and obstruct the tone. A great organ should be placed, as is an orchestra, with greater width than depth, so that each instrument will obtain its full volume. The builders of the Cincinnati organ were offered all the space they required, and they gladly took advantage of the opportunity to give every part of it all the room it needed. There are few, if any, organs out of Germany arranged in a manner so orderly and artistic.



MORNING. NOON. EVENING.

CHAPTER IV.

LIST OF PERSONS WHO DESIGNED AND CARVED WOOD WORK IN THE ORGAN SCREEN, WITH THE NAMES OF GIVERS OF CARVED WORK, AND A LIST OF THE SUBJECTS.

CARVED WORK EXECUTED UNDER THE SUPERVISION AND IN THE ATELIER OF HENRY L. FRY.

DESIGNER.	SUBJECT.	CARVER.	GIVER.
William Fry...	Trumpet Vine.....	William Fry.....	Mrs. John Shillito.
William Fry...	Passion Flower.	William Fry.....	Misses Clara and Florence Fletcher.
William Fry...	Honeysuckle Frieze.....	William Fry.....	Miss K. B. Nettleton
William Fry...	Oak Leaves (Beethoven).	William Fry.....	Mrs. A. Marshall.
Laura Fry.....	Ivy (Mozart).....	William Fry.....	Mrs. A. Hinkle.
Laura Fry.....	Laurel (Bach)	William Fry.....	Mrs. S. Winslow.
Laura Fry.....	Lilies (Mendelssohn).....	Laura Fry.....	Mrs. Col. L. M. [Dayton.
Laura Fry.....	Hawthorn (Handel).....	Mrs. J. B. Thresher, of Dayton, Ohio...	Mrs. J. B. Thresher.
Laura Fry.....	Wisterea.....	Miss J. Rice.....	Miss J. Rice.
Laura Fry.....	American Ivy.....	Miss F. Banks.....	Miss F. Banks.
Laura Fry.....	Morning	William Fry.....	Mrs. Dr. Williams.
Laura Fry.....	Noon.....	Mrs. F. H. Force...	Mrs. F. H. Force.
Laura Fry.	Evening.....	William Fry.....	Mrs. T. Philips.
Henry L. Fry.	Daisy Spandrel.....	Miss A. Holabird....	Miss A. Holabird.
Henry L. Fry.	Daisy Spandrel.....	Miss Emma Riley...	Miss Emma Riley.
Henry L. Fry.	Various, Balance of Section.....	Henry L. Fry.....	Organ Committee.

CARVED WORK EXECUTED IN THE SCHOOL OF DESIGN OF THE CINCINNATI UNIVERSITY UNDER THE DIRECTION OF MR. BENN PITMAN.

NAME.	SUBJECT.
Mrs. E. F. Abbott	4-in. wainscot panel (incised).
" " "	4-in. wainscot panel.
" " "	6-ft. dog-tooth molding.
Miss Alice J. Albro	4-in. wainscot panel.
Miss Emma Alexander	2 6-ft. panel moldings.
" " "	Panel top moldings.
" " "	6-in. wainscot panel.
" " "	Composer panel (Scarlatti).
Miss Sallie J. Anderson	Panel top molding.
Miss Sallie B. Armstrong	2 6-ft panel moldings.
" " "	Panel top molding.
Miss Abby Allen	Upper lozenge panel.
Miss Bertie Baker	4-in. wainscot panel (incised).
Miss Nettie N. Barker	4-in. wainscot panel.
Mrs. S. M. Barrett	2 top panel molding.
" " "	1 4-in. wainscot panel (incis'd).
" " "	1 6 in. wainscot panel.
" " "	1 Composer panel (Haydn).
" " "	6-ft. dog-tooth panel molding.
" " "	1 4-in. wainscot panel.
Miss Louise Bently	2 6-ft. panel moldings.
" "	1 6-in. wainscot panel (relief).
Mrs. M. E. Black	Top panel molding.
" " "	6-in. wainscot panel.
" " "	3 dog-tooth panel moldings.
" " "	1 composer panel (Cherubini).
Miss Bertie Blinn	4-in. wainscot panel (incised).
Miss Mary E. Brown	3 6-in. wainscot panel (incis'd).
Miss Lizzie Brunell	Wainscot panel.

Miss Daisy Burnett.....4-in. wainscot panel (surface).
Miss Hattie D. Cadwell.....6-in. wainscot panel.
" " " .....Upper (diaper) panel.
Mrs. Virginia Campbell.....Upper panel (incised).
Miss Isora Collard .....6-ft. panel molding.
" " .....Composer panel (Rossini).
Mr. W. C. Collins.....2 6-ft. panel moldings.
Miss Jennie F. Comstock...Panel top molding.
" " " ...6-ft. dog-tooth molding.
" " " ...Upper (diaper) panel.
Miss Marian L. Cook.....2 6-ft. panel moldings.
Miss Lizzie M. Cooke.....Short panel molding.
Miss Lotta E. Crofton.....2 panel top moldings.
" " " .....1 upper (diaper) panel.
Miss Sallie Dale .....6-in. wainscot panel.
Miss Blanche Darr.....Upper panel molding.
" " ... .6-in. wainscot panel.
Mrs. E. C. Dawes.....6-ft. dog-tooth panel molding.
" " " .....6-in wainscot panel.
Miss Essie DeCamp.....Panel top molding.
" " ... .6-in. wainscot panel.
" " .....Composer panel (Schumann).
Miss Rena DeCamp.....Panel top molding.
" " . ..... 6-in wainscot panel.
Miss Mary M. DeForest.....6-ft. dog-tooth panel molding.
Miss Ada P. Drake.....6-ft. panel molding.
" " " .....6-ft. dog tooth panel molding.
Miss Sarah Dunlap.....
Miss Julia M. Eggleston....6-ft. dog tooth molding.
Miss Sallie B. Elrman.....6-in wainscot panel.
" " " .....Upper (lozenge) panel.
Miss Lida Elstun.....Top panel molding.
" " .....6-ft. panel molding.
" " .. ..Upper (diaper) panel.

Miss Annie Empson..... 6-ft. dog-tooth panel.
" " .....Composer panel (Shubert).
Mrs. Aurelia Fisher.....4-in wainscot panel.
Mrs. L. R. Forrest..... .....6-ft. panel molding.
Miss Lillie E. Fox.....Panel top molding.
" " " .....4-in. wainscot panel.
Miss Annabelle Frantz.....6-ft. dog-tooth molding.
Mrs. L. Freeman.....Top panel molding.
Mrs. C. J. French.....2 upper panel moldings.
Miss Carrie H. Gedge.....2 6-ft. panel moldings.
" " " .....1 6-ft. dog-tooth panel molding.
Mrs. W. H. Gibbs.....6-ft. panel molding.
Miss Clara Grever.....2 panel top moldings.
" " .....1 upper (diaper) panel.
Miss Clara Gurley.....Top panel molding.
Miss Kate Hall..... .....2 upper panel moldings.
Miss Mamie Hickman.....Upper panel molding.
Mrs. F. Hinkle.. .....4-in. wainscot panel.
Miss Claude R. Hirst.....Panel top molding.
Miss Nettie Illowy.....6-in. wainscot panel.
" " .....6-ft. dog-tooth molding.
Miss Ella Ingoldsley .....6-in. wainscot panel.
Mrs. Harriet James.....6-ft. panel molding.
Mrs. B. M. Johnston.....Upper (diaper) panel.
Misses H. and M. Johnston.2 6-ft. panel moldings.
" " " " 2 6-in. wainscot panels.
" " " " Composer panel (Wagner).
Miss Laura Jordan.....2 6-ft. panel moldings.
Miss Lilly Keenan.....Panel top molding.
Miss Louise Kerr.....4 wainscot moldings.
Mrs. W. R. Kidd.....Panel top molding.
Mrs. Myra E. Kinsey.....4-in. wainscot panel.
" " " .....Upper (diaper) panel.

Miss Lizzie Laws.....Panel top molding.
" " .....4-in. wainscot panel (surface).
" " .....6-in. wainscot panel.
Miss Lillie Lonnell.....Top panel molding.
Miss Hannah LeVoy.....Panel top molding.
" " .....6-ft. dog-tooth panel molding.
Miss Sarah Levy.....6-ft. dog-tooth panel molding.
" " .....6-in. wainscot panel.
Miss Lizzie M. Lupton.....2 upper panel moldings.
Miss Emma Marqua.....Upper panel molding.
" " .....4-in. wainscot panel.
" " .....6-ft. dog-tooth molding.
" " .....Upper panel (surface).
Miss Jennie McCaddon.....Panel top molding.
" " .....4-in. wainscot panel (surface).
" " .....4-in. wainscot panel.
Miss Phoebe Mead.....4-in. wainscot panel (incised).
Miss Mary L. McLean.....6-in. wainscot panel.
Miss Susie Merrill.....4-in. wainscot panel (incised).
Miss Amy Merryweather...Panel top molding.
" " ...6-ft. dog-tooth molding.
Mrs. Martha Miles.....4-in. wainscot panel (incised).
" " .....6-ft. dog-tooth panel molding.
Miss Ida Morehead.....6-ft. dog-tooth panel molding.
Miss Kate Morris.....6-ft. panel molding.
Miss Adelaide Nourse.....Panel top molding.
" " .....6-in. wainscot panel.
" " .....6-in. wainscot panel.
" " .....2 upper panel moldings.
" " .....Upper (diaper) panel.
Mrs. E. F. Noyes.....6-in. wainscot molding (proxy).
Miss Mary L. Pack.....4-in. wainscot molding (inci'd).
" " " .....4-in. wainscot molding (relief).
Miss Jennie M. Phillips.....6-ft. panel molding.

Miss Jennie M. Phillips.....Composer panel (Gluck).
Miss Carrie E. Phillips.....Panel top molding.
" " " .....2 6-ft. panel moldings.
" " " .....4-in. wainscot panel.
" " " .....Composer panel (Porpora).
Miss Lizzie R. Potter.....6-ft. dog-tooth molding.
" " " .....4-in. wainscot panel (incised).
" " " .....6-in. wainscot panel.
" " " .....Composer panel (Meyerbeer).
Miss Alice B. Powell.....4-in. wainscot panel.
" " " .....6-ft. dog-tooth panel molding.
Miss Carrie Pruden.....4-in. wainscot panel (surface).
" " .. ..4-in. wainscot panel (surface).
Miss Flora Ray.....Dog-tooth molding.
" " . .....Top panel molding.
Miss Julia Rice.....Upper panel (lozenge).
Miss Mamie Rice.....Upper panel (lozenge).
Mrs. E. P. Rogers.....6-ft. panel molding.
Miss Jennie N. Roots.....Panel top molding.
" " " .....4-in. wainscot panel.
Miss Helen Ruthenburg.....6-ft. dog-tooth molding.
Miss Ella M. Shaddinger...Panel top molding.
" " " ...Top panel molding.
" " " ...Upper panel (surface).
Miss Louise Shaw..... ...6-in. wainscot panel.
Miss Rose D. Slevin.....Upper panel molding.
" " " .....6-ft. dog-tooth molding.
Miss Jennie Smith.....6-in. wainscot panel.
Miss Grace Spencer.....4-in. wainscot panel (incised).
" " .....4-in. wainscot panel (relief).
Miss Clara A. Stannus.....6-ft. dog-tooth panel molding.
Miss Claribel Stevens.....2 dog-tooth moldings.
" " .....Upper panel molding.
Miss Mary B. Swift.....Top panel molding.

Miss Alice B. Teasdale.....Panel top molding.
" " " .....6-in. wainscot panel.
Mrs. G. P. Titus.....6-in. wainscot panel.
Miss Augusta Tozzer.....6-in. wainscot panel.
" " .....6-ft. dog-tooth panel molding.
Miss Nancy Vallandigham.2 6-ft. panel moldings.
Mrs. Ida Waterman.....4-in. wainscot panel (incised).
" " .....Upper panel (surface).
Miss Nettie Wenderoth.....4-in. wainscot panel (incised).
Miss Fannie Y. Ward.....6-ft. panel molding.
" " " .....4-in. wainscot panel (surface).
" " " .....Upper (lozenge) panel.
Miss Theiza L. Westcott....6-in. wainscot panel.
" " " ....4-in. wainscot panel (surface).
Mrs. A. E. White.....4-in. wainscot panel.
Miss Kate Wilson.....Upper panel molding.
Mrs. T. A. Wren.....4-in. wainscot panel.
Mrs. Emily H. Wright.....6-ft. dog-tooth panel molding.

CHAPTER V.

THE ORGANIST.

But this great organ, with its mighty mechanism, would be helpless, speechless, without the touch of a master. It can well be imagined that only a great artist can give full expression to the vast powers of such an instrument. Fortunately, Mr. Geo. E. Whiting, an organist of the highest accomplishments, will display the full capacities of the organ. Mr. Whiting has watched its construction from the first moment it was begun, and knows the mystery of its power. He is not only the master of the technique of organ-playing, but he is a superior musician, and he has a proper conception of what belongs to the dignity and honor of the great instrument. The following quotations from a letter written by him are of interest and importance, and show his fitness for the office he is called upon to fill:

THE MANNER OF MANAGING THE ORGAN—MR. WHITING'S LETTER.

"In the year 1862, I had the honor of being the *last* pupil of Best, the great English organist; and as I resided in Liverpool at that time, I had abundant opportunities of becoming familiar with the manner in which the corporation of Liverpool manage the great St. George's Hall organ (at that time the largest in the world).

"Since then concert organs have been built at Leeds, Manchester, Doncaster, Bristol, and London (Albert Hall);

but the manner in which the Liverpool organ is managed has been the model for the others in almost every respect.

"The organ in St. George's Hall is played by Best three times each week, except for six weeks in the summer, and occasionally when the hall is being used for other purposes. The hours of performance are on Thursdays, at eight in the evening, and on Saturdays, at two in the afternoon, and at eight P. M.; these hours being selected, I understood, for the convenience of the *working classes*. And this brings me to the principal object (as the English look at it) of a *concert organ*, viz., as a great educating influence among the masses. Now, in order to achieve this result with the Cincinnati organ, it is of the greatest importance that *that* instrument shall not be used in the way of *making money*, or, at any rate, having that for the *principal* object.

"I also hope the managers will avoid the following mistakes: 1. Never allow a poor organist (or one who is not familiar with concert-playing) to give public performances on their organ; 2. Never give a performance without a *printed* programme; 3. Avoid *changing* the performer as much as possible, as the reputation of the organist and organ ought to grow together. (Best is the only organist in England that has ever given public performances on the St. George's Hall organ; consequently, his reputation, and that of the organ, are inseparably connected); 4. The organ should not be played *on all times and occasions;* for instance, it should not be used for *promenade concerts* (!), thereby reducing the 'king of instruments' to the level of a quadrille band or a hand-organ! Neither should it be played while the audience are taking their seats at lectures, etc., the last place, in my opinion, where an organ should be heard. Certainly, nothing of the kind was ever heard of in Europe.

"*Organ music* requires, on the part of the auditor, the

closest attention, and as the organ does not possess the 'percussion' of the orchestra, it is not adapted to concerts where the attention of the audience is only partially given to it.

"Consequently, I hope the Cincinnati organ will be played *not too often*, and when it *is* played, always by the same performer, whoever he may be. (It takes a lifetime almost for an organist to learn to handle *properly* an instrument of that size. Best frequently remarked to one, that he had been playing the St. George's Hall organ for six years, and *he* considered he had much to learn in the handling of it.)

"In my opinion, the directors of the Cincinnati Hall and organ will advance the musical taste and culture of their city, in the best manner, by managing their organ after the plan of the English corporations, the main points of which are as follows:

"1. A permanent, resident organist.

"2. A small sum for admission (the Liverpool charge being never more than six pence), so that the poorer classes can avail themselves of the privilege of listening to one of the finest organs in the world.

"3. The programmes performed on their organ should not be confined to any *one* school of music, but should embrace *everything* that it is possible to make effective on the organ (and there are but very few things that can not be played on an organ as large as this).

"The programmes should be made up with the *greatest* care (an art in itself), and should always contain—with a good proportion of Bach, Handel, Mozart, Haydn, Beethoven, etc.—selections from the composition of living composers, the great orchestral school of Germany, the wonderful operatic music of France and Italy, and the cathedral and organ music of England. I would have everything

that is *good music* and effective, played in the best manner on the instrument.

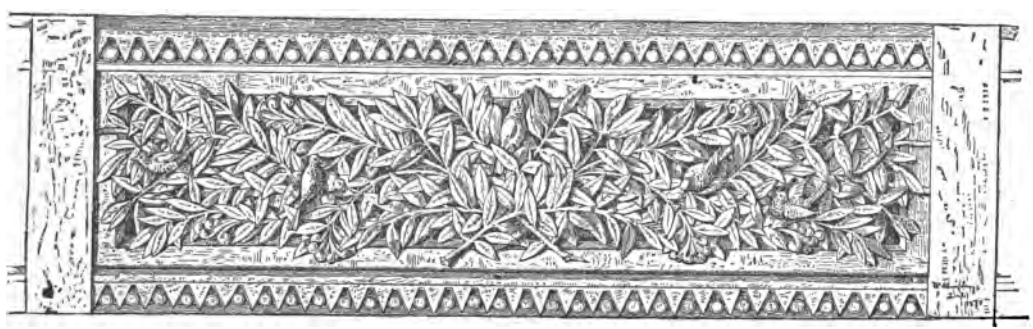
"Finally, I firmly believe that in *this* way an audience can always be had for two or more performances a week, from their own city, and that the concerts would grow in interest the longer they were continued; at any rate, such has been the result in England.

"These suggestions (and they are only suggestions) are presented for what they are worth, to the gentlemen having the Cincinnati organ in charge, as the result of much observation and considerable experience. Not that they can all be carried out in this country by any means, but in the hope that some of them may be found of value.

"I remain,

"Yours very truly,

"GEO. E. WHITING."



THE HONEYSUCKLE.

CHAPTER VI.

THE MUSICAL MECHANISM OF THE ORGAN.

While it is desirable in this book to give the technical character and construction of this organ—a description which would satisfy those who have a professional knowledge of the instrument—there is a much larger class of people who know nothing whatever of technical expressions, such as "stops," "swell boxes," "pneumatic action," and so on. Simply and briefly as possible we will try to explain what these terms mean, so that every one will comprehend the whole scheme of the organ.

When we approach near to the central part of the organ, we at once are attracted by the seat of the organist. Here, in full view, are the seat, the key-board, the register knobs, pedals, and all the other apparatus by which the player gives voice to the great instrument. Later on, when we have been inside the organ case, and looked with astonishment and bewilderment upon the thousands of pipes, the huge bellows, the net-work of trackers, and big swell chests, thirty feet in air, and all the other machinery which fills the large space, our wonder surpasses description to reflect, that one man, in an easy sitting posture, has within reach of hands and feet the power to set in motion this vast, delicate, massive, and complicated machinery, to give to its many thousand tongues the divine power of language, to breathe forth in strains of music the sublime creations of the masters.

With most organs the key-board and seat are hidden behind railings, or obscurely planted upon the floor of the

stage, or set into a hole (like the Boston organ) in the body of the instrument, where the performer can not be seen, where he can not hear what effects he is producing. Like a mole, he works in the dark. The projectors of the Cincinnati organ resolved to break away from the insufficient precedents of the past. They brought the seat and manuals far in front of the organ, and raised it more than the stature of a man above the floor, where the player could hear clearly the highest and the deepest tone, and where he could see and be seen.

Let us examine more in detail the machinery by which the organist commands the organ. But first we will look back and learn something of its history.

ITS INVENTION.

No precise date can be fixed upon for the invention of the organ. Reed instruments may be traced back as far as Genesis or the pipe of Pan, but the first resemblance to our modern organ is seen in an old Hebrew instrument, the "macraphe d'aruchin." It consisted of an oblong box, with a row of reeds like inverted whistles along the top, and on one side a row of metal bolts, which could be pulled out or shoved in to turn on or shut off the wind, like our draw stops or register knobs. The wind was supplied by two bellows, like common fire-bellows, fastened on the other side, and resting on a simple frame. This instrument belonged to a period before the birth of Christ.

The close of the eleventh century forms an era in the history of organ-building. An organ was then erected in the cathedral at Magdeburg, with a key-board of sixteen keys. In the earlier organs from nine to eleven notes only were used, and the old chants required no more. Harmony was still unknown at this time. The keys of the Magdeburg organ were an ell long and three inches broad. Each

key had to be pounded by the fist of the performer, whence, according to Seidel, arose the expression, organ-*beater*. The bellows gave the early organ-makers great trouble. In a large organ they could only multiply the number. Twenty were sometimes required for a moderate sized instrument. The organ at Winchester is said to have had twenty-six; that of Magdeburg twenty-four. They were made in folds like a blacksmith's bellows, and were not provided with weights, as in our modern organs. The wind was not proportioned either, so it depended on the force of the individual who blew the bellows. It is easy to see, therefore, that the organ could never have been in tune; for the wind must have been admitted unequally. The bellows were arranged in two rows, with a railing running above them, and a wooden shoe fastened to the top of each. The *blowers* each worked two, putting their feet in the shoes, clinging to the railing with both hands, and alternately raising one bellows and lowering the other.

The monks of the middle ages took an interest, not only in decoration, but in organ building. In the course of the fourteenth century, they improved the key-board, increased the compass to nearly three octaves, and made the keys small enough to be pressed down by the fingers.

The pedal was invented toward the end of the fourteenth century, and improved by Bernhard, a German, organist to the doge of Venice between 1470 and 1480.

HOW IT IS PLAYED.

The organ is played on by the feet as well as the hands, so that the greatest musical compass of the instrument runs from the lowest pedal note to the topmost key on the key-board. The total compass is technically styled "clavier," to cover both the term "manual," which is used for the notes played by the hands, and "pedal," for those played by the

feet. "Diapason" is rather an obscure term. It originally meant octave, which number of notes constituted the entire key-board of the early organs. It is now used to designate those "stops" in an organ which are most important and full in tone and compass. The pitch and tone of the lesser stops is gauged by them. They are called "open diapasons," when the pipes which compose them are open, and "stopped diapason," when the pipes are closed at the top.

The Cincinnati organ comprises five different organs:

The great organ.

The swell organ.

The choir organ.

The solo organ.

The pedal organ.

These may be played separately or in combination.

STOPS.

There are in large organs four key-boards, one above the other. The range of each is just one note less than five octaves, beginning at C, and ending at B. These are called "manuals." The Cincinnati organ has also a pedal of two and a half octaves—thirty notes. The pipes are arranged in sets or series. Each set, the range of which extends from the lowest to the highest note on the clavier, having the same quality and strength of tone throughout, and the mechanism of which will allow them to be sounded independently of those of the other sets, is called a *stop*.

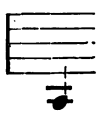
"TRACKERS" AND "SQUARES."

The "pallets," or valves, which admit the air to the pipes, are connected with the small bellows of the pneumatic box by means of strips of wood about five-sixteenths of an inch wide, and one-eighth of an inch thick, called "trackers."

They vary in length, are joined together when the distance they have to go is considerable, and when they have to go around corners have a wooden or metal joint fastened between them, like an elbow, called a "square." These squares are secured by a metal rod, which passes through them, and on which they move freely. The keys and the pneumatic box are also connected in this way.

The Cincinnati organ has ninety-four stops.

Stops also vary in pitch and in tone; some imitating the different instruments in an orchestra, and one the "vox humana." This organ has sixteen pedal stops. The lowest of these is called the 32-foot "open diapason," because it is composed of open pipes, the longest of which is thirty-two feet long. This pipe sounds the lowest note producible in music, C, two octaves below the bass note—



This note is almost invariably used with the C an octave above it, to strengthen the latter. By itself it is only an uncertain muttering. The lower a note is, the fewer are the vibrations of air which produce it. As this one is made by only sixteen and one-half vibrations a second, the ear can detect the separate pulsations, and it is scarcely a more musical sound than the quivering hum of a planing-mill.

THE DRAW STOPS.

The draw stops, or "register knobs," regulate the use of the stops. In the Cincinnati organ they are arranged on each side of the "manuals," on seven small tiers, which are placed at an obtuse angle to the line of the key-board, for the greater convenience of the performer in reaching them. Over the lower key-board there are also five knobs, which work the "mechanical registers." These separate or "couple," and combine the different stops. There are also twelve pedal movements, controlled by the feet, which are

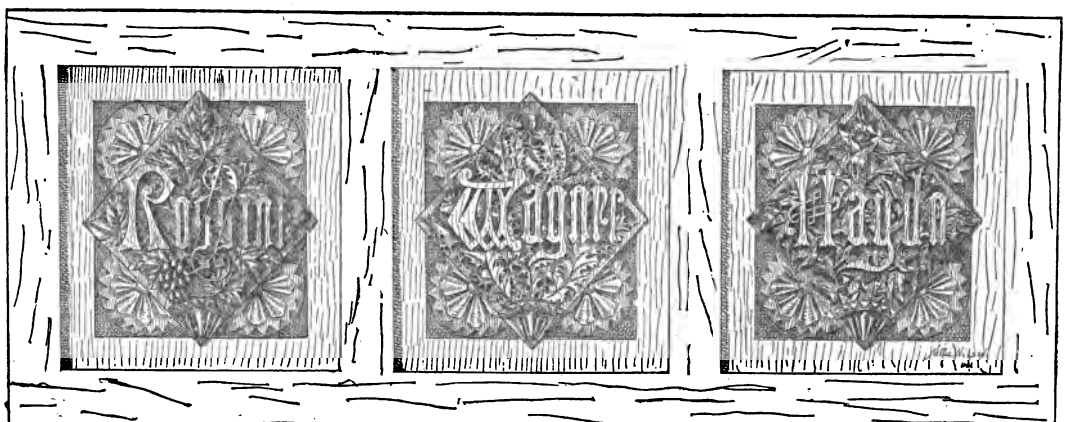
used for similar purposes. The "couplers," as their name indicates, unite the different "stops" or "organs," whenever combinations are wanted. The large iron pedal in the center is called the "balance-pedal," and acts upon a swell box.

THE SWELL BOX

of the Cincinnati organ is up near the center of the top, and is a wooden box twelve feet square. It is used in making crescendos or diminuendos. The front is composed of slats, like a wooden Venetian window-shutter placed perpendicularly. These slats are about eight or ten inches broad. They are worked by the balance-pedal, and moved on the principle of a shutter. Hence, this is also called the "Venetian swell." When closed, the sound is soft; when opened, loud. When this is skillfully controlled, therefore, we can have a sforzando—an echo—and a gradually increasing or diminishing swell.

PNEUMATIC ACTION.

Large instruments, where there is a great resistance made by the wind, and where the pipes are far away from the keys, require so much muscular strength, and were so fatiguing, that it became necessary to invent some other means to overcome this difficulty, and assist the performer. This idea of the pneumatic lever first occurred to the late Mr. Joseph Booth, organ-builder of Wakefield, who applied it to the organ built for a church near Sheffield, in the year 1827. In the direct action, the key, when pressed down, operates immediately upon the valve, which admits the wind to the pipe. In the pneumatic action, the pressing down of a key opens a valve leading into a small bellows. The working of this bellows admits the air through the valves to the pipes. Each key-board has its own pneumatic box, and each key works its own little bellows. The



GRAPE. THISTLE. CONVOLVULUS.

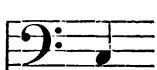
four boxes are placed one on the other, forming a chest of four shelves behind and under the platform where the organist sits. The performer on the great organ, accordingly, does not produce the sound directly when he touches the keys, but only sets to work a small bellows, and the small bellows is responsible for the sound, as it works the valve which lets in the air to the pipe.

THE PIPES.

The Cincinnati organ has 6,237 pipes. The longest is thirty-two feet long, made of wood. The shortest, made of metal, is a half an inch long.

The square, wooden pipes have an oblong opening, or mouth, on the front side, where the body of the pipe is joined to the foot or inverted pyramid, on which it rests. Between the body and the foot is a metal plate, with a narrow aperture in it to let the air through. The sound is produced by the air *whistling* through this fissure and out of the mouth, and the note produced is high or low, according to the length of the pipe.

Reed pipes, or "tongue pipes," on the contrary, are those which produce their sound through a mouth-piece (not unlike that of a clarionet), furnished with an elastic plate of metal, but which do *not* depend upon the length of the pipe for the gravity or acuteness of their sound, but on the size of the mouth-piece and the vibrations of the tongue. Accordingly, while in the wooden pipes a length of eight feet is required to produce the bass note, CC—



in the case of the vox humana stop, the same note is made by a reed pipe eighteen inches long.

THE WIND-CHEST.

The wind chest is a long, broad, rather shallow box. Each separate organ has one. The top of the chest, called the "sound-board," has holes in it, in which the pipes are fastened. The air from the bellows accumulates in the wind-chest, which is a sort of reservoir, and keeps the air ready for use, whenever the valve of any one of the pipes shall be opened.

THE WIND-TRUNKS.

The wind-trunks are wooden tubes, which convey the air from the bellows to the different wind-chests. They vary in length, but are made as short as possible always, because the wind loses in power by the distance it has to travel, and the nearer the bellows and the sound-board, or top of the wind-chests, are to each other, the more prompt and decided will be the speech of the pipes.

After the air has been pumped into a bellows of an organ, it is there compressed by the means of weights placed on its top. The greatest number of pounds used in this way in the Cincinnati organ is thirteen hundred, which gives what is called an eight-inch pressure. A force of wind is thus obtained, so great and fierce, that, when admitted to the mouths of the monster bass pipes, they vibrate like reeds, and give out a huge volume of sound. The compressed air is not conveyed direct to the pipes from the bellows, because there would not be room over them for such large pipes to stand; besides, there are valves and slides that must be accommodated as well as the pipes. It is found to be necessary, for the sake of room, and also for a harmony of tone, to distribute the pipes in a large space. Some of them are needed for the purpose of ornament in front of the organ, many feet away from the reservoirs, which are placed on the lower level. The compressed air is carried by the

"wind-trunks" through the most convenient route, around corners, if occasion compels that way, to where the pipes stand. An even pressure is maintained by the use of concussion bellows, called "winkers," or by an elastic diaphragm.

The air is delivered by the trunk into the "wind-chest." Formerly there was but one chest to each organ; but now that organs are built of so large a capacity, these chests are increased in number. In the Cincinnati organ there are seventeen different wind-chests, all on different levels, and in various parts of the great case. The largest one is fourteen feet long, five feet six inches broad, and sixteen inches deep, while some serve but two pipes. The upper board of a wind-chest is something like a chess-board, with a pipe above each square. Each row of pipes, from right to left, is what has already been described as a "stop," which is controlled at the key-board by a lever, which moves a slide immediately below the ends of the pipes in the wind-chest. The "slider" has holes which exactly correspond to the holes in the upper board at the foot of the pipes; so that when the "slider" is drawn out, there is a hole from the "wind-chest" into the row of pipes, and when it is shoved in, the openings are closed. Therefore, before the organist plays he draws the stop or stops that he wishes to use.

It will be remembered each row of pipes on the board, from front to rear, is the same note in the different stops. These rows are controlled by the keys in the manuals. If the key is pressed, then the air is admitted from the "chest" into a groove that has been previously covered by a valve connected with the key, and enters the pipe or pipes which have their sliders drawn. No pipe speaks until the drawing of a stop frees the holes at the bottom of the pipes, and the key is struck to allow a supply of air to rush in under the pipes. Each key controls its own separate air-tight

compartment or wind reservoir in the wind-chest, and each stop has one pipe over this compartment. If the size or shape of pipes will not permit of their standing in rows, then they are placed as convenience dictates, and channels are cut from the grooves to reach them, wherever they may be. A wind-chest is, then, a shallow air-tight box, which holds the compressed air until it is delivered to the pipes. It has on its top, like rows of candles in an old-fashioned mold, the ranks of pipes belonging to the stops which are fed from the wind-chest. Inside, running transversely, are the valves or pieces of leather-colored wood, as thick as the wrist, which shut the hollow grooves or canals that lead across the box to the same-noted pipes. The valves are hinged at one end and attached to a tracker at the other. They are kept in place by a wire spring.

THE BELLOWS.

Each of the five organs has a separate bellows. Each bellows is a square box, five feet by eight in size, and about two feet deep. It is made of wood, with a wooden top. The top is joined on by folds of leather, and rises up and down when it is in motion. The box is filled through square openings or gratings closed by valves, by feeders placed under it. The feeders have each a bottom board and leather sides, and are worked by means of beams which are fastened to them at one end, and which run down into the cellar, where the other end joins the "breaks" or pumping beams. Weights of stone are placed on top of the bellows, in order to obtain force enough to produce a full tone in the pipes. The five bellows require a pressure of 4,500 pounds; thirteen hundred of which is used for the solo-organ alone. This gives it eight-inch pressure. The great organ, and part of the pedal, have a four-inch pressure, and the choir and swell a three-inch pressure. A six-inch

water-pipe has been found necessary to gain the force needed to drive the water motors. These motors are pumps which are worked by the water. There are five, of three-horse power each. Three of these are enough to supply all the wind needed to work the organ; but Messrs. Hook & Hastings preferred to put in the two additional ones, to be on hand in case any of the others should fail. There is also a break to each bellows, to be worked by two men, if the water-power should utterly give out; so that, even if the river and the reservoirs should run dry, the great organ may still be heard.

THE WATER MOTORS.

The common method of filling the wind reservoirs of an ordinary sized organ is by a bellows pumped by a boy, whose position is in the rear and unseen. In larger organs, where great power is needed to secure the great amount of air and pressure of wind, the boy gives place to a small steam-engine. This is the power generally used abroad. The Primrose Hill organ, in London, one of the greatest organs in the world, has an engine of eleven-horse power. The St. George's, of Liverpool, has one of ten-horse power, and the Albert Hall, rated as the largest, although not really greater than the Cincinnati organ, one of fifteen-horse power. American genius has invented an engine for this purpose, far more convenient and less expensive by far than the steam-engine. It is called the water-motor. This machine is the kind that is used to give the power to the organ. There are five of them, each of three-horse power, one connected by a beam to the levers of each of the five bellows. The machine is an invention of P. H. & F. M. Roots, of Connersville, Ind. They are placed in the cellar, just under the organ, and in direct connection with it, and rest on the ground. In size, they are about three feet square and two

and a half high. On an iron platform, there are two wheels, ten inches in diameter, inclosed in a strong iron box, and from the wheels, the rods that convey the motion to the opposite side, where is the wheel to which the beam is attached. Water is admitted into the box from above, and discharged below. It is so contrived that there is no escape for the water which presses in the wheels, unless they turn, and when one turns the other turns, at once closing the gap. They are unlike turbine wheels, which act from percussion. No, these act by pressure alone. If the turbine wheel is fixed, the water runs through; if these wheels are at rest, no water escapes. It is a very simple and effective contrivance to produce power, very easily handled, and not liable to get out of order. At any moment, when something is the matter with the water-mains, they can be instantly set in motion, and as quickly stopped. No fires have to be lighted, and no fuel wasted to generate the power.

Beside the wheel, there is a short beam, with a weight hung upon it, which acts as a governor. When the bellows is empty, a cord, joined to the bellows and this beam, lets the weight down, which opens the valve for the water to enter the machine, and as the bellows fills, this string lifts the weight on the beam, gradually shutting off the water supply. In this way, it is self-acting, and needs no attention from any one. When the organist wishes to use the organ, he pulls a handle at the side of the key-board. This opens the valve of the main pipe, and the water rushes into the different pipes that lead to the different engines, and they begin to work, and cease only when the bellows are charged. A similar touch to the handle shuts off the whole supply, and the pipe is closed.

Ten men would be needed to do the work that these beautiful little contrivances accomplish, and then not nearly the amount of the work which these engines are capable

of doing. More power is provided than was actually required, in order to give ample provision in case of accident.

THE CARILLONS.

The carillons of the Cincinnati organ are a series, 32 in number, of steel bars, firmly placed upon a frame. They are played upon by hammers, which fall upon the bars, producing a singularly sweet and musical sound. The carilloons, in Holland, are a number of bells, which sometimes have three octaves, with the semi-tones.

CHAPTER VII.

DESCRIPTION OF THE MUSICAL MECHANISM OF THE CINCINNATI ORGAN, BY E. J. KILBURN.

The following admirable description of the musical part of the Cincinnati organ is written by E. J. Kilburn, of the house of Hook & Hastings:

Approaching the organ from the hall, where we have examined and admired the exterior, the first object that claims our attention is the key-desk. The first look at the bewildering array of key-boards, register-knobs, thumb-knobs, pedals, tablets, which are here located for the convenience of the organist, and to enable him to handle this huge musical instrument, causes the involuntary question—What are all these things for? How can any one tell where to put their hands to produce the effects desired? Our guide explains, first, the key-boards—that the lower one is the choir organ; the second, the great organ; the third, the swell organ; and the fourth, or upper, the solo organ.

Each of these key-boards is composed of 61 notes (from C_0 to C_4), five octaves long, and each controls the valves that admit the compressed air to the pipes belonging to that organ, or division of the whole organ. Just above the great organ key-board, are placed five white thumb-knobs, and a smaller black one near each, while between each pair is a tablet, showing its use. These thumb-knobs control the couplers by which the various key-boards are connected to the great organ key-board, so that either may be played from it, without removing the hands. To see this operate,

a chord is held on the great organ, the second knob from the left pushed in, and instantly the same keys of the swell organ come down. Touching the black knob, and the swell keys are as quickly released. The third knob affects the choir keys in the same manner.

The fourth couples the choir keys of an octave below to the great, and the fifth couples the solo keys to the great. With all these knobs put in, every manual pipe in the whole organ can be played from the great organ key-board.

Above the key-boards, and under the music-rack, are a row of tablets, which serve as a directory to the combination pedals, showing the effect of each. Here also are two circular disks, one informing the organist as to the amount of compressed air in the bellows, and the other shows the position of the crescendo pedal.

Looking under the manual key-board, we find the pedal key-board, which has a compass of thirty notes (from C to F°), two and a half octaves. Here we have the white and black keys, the same as on the manual key-boards, only made of wood instead of ivory, and larger, as they must be played with the feet. This key-board opens the valves to the pipes of the pedal organ, which includes the immense thirty-two feet open diapason pipes.

Just above the pedal organ key-board lies the crescendo pedal, a slide having frequent projections against which the feet are pressed in operating it. Above this, again, we see the row of combination pedals, ten in number, and in the center the swell pedal, which is so nicely balanced and adjusted that a very slight movement of the toe or heel causes it to act, and yet it remains exactly where it is left.

To the right and left of the manual key-board are terraces of knobs, angled so as to be fronting the organist, and all within his easy reach. These bear upon their face the names of the different registers or sets of pipes which

make up the whole organ. Each of these registers represents a complete set of sixty-one pipes—more in some cases. Besides, the name, is engraved the division of the organ to which they belong, as great, swell, choir, solo, and pedal, and also the pitch of each set, expressed in feet, as 32 ft., 16 ft., 8 ft., 4 ft., 2 ft., which means that the lowest note of the stop produces 32, 16, 8 (as the case may be) feet tone. Some are marked thus: 4 rks., 7 rks., 3 rks., meaning that there are 4, 7, or 3 pipes, which speak whenever a single key is held. Now, while holding down the keys to show the operation of the couplings, how is it that we have heard no sound? It is because none of the registers have been drawn. The key opens the valve that admits the wind into the channel under the pipes, but the register moves a slide which allows it to pass from the channel into the pipe, and until the slide is drawn no pipe receives the wind necessary to make it speak. Having thus rather hastily surveyed the key-desk and what it contains, we will look at the motors which furnish the power for making these things available, and into the interior to examine its wonders.

Passing into the cellar under the organ, we notice the foundation upon which it stands. Large brick columns, placed closely together, reach from below the surface to the heavy capping timbers on which the floor timbers are laid. These are covered with two thicknesses of flooring, the upper one of which is of two inch pine, the whole forming a support that will sustain the immense weight of the instrument without the slightest deflection. Solidity in the foundation is one of the prime necessities for a successful result in the tonal, but especially in the mechanical portion of the organ, for where there is so much complicated action, a very slight change at one point may, by the system of leverages employed, become so magnified at others, as to entirely disarrange and make useless a large section of the ac-

tion. In the cellar are located the motors which furnish the power to operate the bellows.

Five motors, built by the Messrs. Roots, of Connersville, Indiana, are employed to operate the five bellows in the organ. To supply these motors, a six-inch pipe is led into the cellar from the street-main, branches from which convey the water, having a pressure of 52 pounds per square inch, to the motor. Each branch has its shut-off and regulating valves, independent of the other; so that in case anything should happen to either, the others can be worked. Here also are the levers for hand-blowing, so that, should the water-pressure fail at any time when it was desirable to use the organ, man-power can be substituted, and no inconvenience result from it, and disappointment be prevented. Returning again to the organ, we pass through one of the rear doors, and by a passage-way reach the front, just behind the key-desk. What shall we say to convey any adequate idea of the scene before us? How describe the apparently confused aggregation of material which lays before, behind, and around? Here are bellows, wind-trunks, running in all directions, huge pipes, line after line of trackers crossing each other and recrossing in seemingly inextricable confusion, great wind-chests; and then the interior of the key-desk. How different it looks from the inside, filled with levers, trackers, arms, rollers, drums, and all the mechanical parts incident to the transmission of motion from the keys, registers, pedals, etc., to the point where it is used.

After the first novelty of the scene has passed away, and we begin to look calmly about us, we notice that the action work extends directly through the organ from the key-desk to the rear, dividing it into two parts. On the lower floor we find, on each side of the action, two huge bellows, one in front of the other, and above the rear one on the right-hand side is the fifth bellows, which supplies the solo organ

with wind under a great pressure. The two front bellows supply the manual pipes, and are united together by large wind-trunks, so that one may assist the other if it becomes necessary. The two in the rear supply the pedal organ and the pneumatic motors.

These also are united, so as to help each other, should occasion demand. The bellows consists of two parts—the feeders and the reservoir. The feeders of these bellows are known as square feeders, in distinction from those usually employed, where they are hinged on one side, called diagonal feeders. The ones before us are one-half the size of the bellows each, and arranged so that as one is going up, the other is coming down. As one drops down, the valves in the bottom open, allowing it to fill with air, which close as soon as the motion changes. This air is then compressed until it raises the valves between the feeder and the reservoir, allowing the air to pass into and inflate the reservoir. To obtain the necessary wind pressure, weight is placed upon the top of the reservoir, and in the aggregate about 5,000 pounds is used for this purpose. Beyond the bellows, on either side, are the lower pipes of the 32 ft. open diapason, those which are seen on each wing of the organ from the hall. By placing a rule on the lower C we find it to be 24 inches in width by 30 inches in depth, with a mouth seemingly large enough to require a bellows of its own to furnish a supply of wind for it. Back in the rear, against the wall, are the pipes of the contra bombard, 32 ft. We examine the lower note of this register, and find that the tone is made by the vibration of a piece of brass, called a "reed," 13½ inches long, 1¼ inches wide, and $\frac{3}{16}$ thick. It vibrates very slowly—you can almost count them—and with such an effect as to be heard even when all other registers are used.

Turning our attention once more to the "action," we are

THE PASSION FLOWER.

shown, and have explained that which connects the great organ key-board with its wind-chests, as the principle and method of transmitting motion is the same in all.

At the end of the key lever we see a brass threaded wire, which passes through it, and is secured by a leather nut. This wire forms the end of the "tracker," to which it is firmly secured. The "tracker" is a very thin strip of wood, $\frac{1}{16}$ of an inch thick, and $\frac{3}{10}$ of an inch wide, made from straight grained pine, and is used to carry the motion of the key or register to where it is needed to open the valves in the wind chests. It looks so very slight that it does not seem possible that it will sustain a strain of a hundred pounds, yet it will, if the strain is applied lengthwise. To insure this condition, every few feet the trackers pass through a "guide," a piece of wood like a comb, having a space just large enough for each tracker to move easily, and yet not allow it to turn. Following the line of the trackers through the guide, we come to a bar at a point where it is desirable to change the direction of the motion, and we find it is accomplished by a set of squares. The square is made of two pieces of wood forming a right angle, and is held to the square-bar by a wire passing through the square at the intersection of the two parts or arms. One arm receives the threaded wire which forms the termination of the tracker we have been following, while the other receives the wire of the tracker which continues the connection, but in a direction at right angles to that previously followed. In this manner we find the key motion is carried till it reaches the pneumatic motors of the great organ, where it terminates by attachment to the valves of the motors. This box we see before us is made air tight, and contains 61 small bellows, one for each note of the great organ key-board, and is supplied from the large bellows with air under pressure. Each of these small bellows has two

valves—one, the inlet, to admit the air to the bellows from the box, and the other, the exhaust, to allow it to pass outside the box. In its normal condition, the bellows is inflated, the valve admitting the air being open and the exhaust valve closed. When the key is pressed down, it opens the exhaust valve, and instantly the inlet valve closes, while the air in the box, under pressure, causes the bellows to collapse, the air in the bellows passing out at the exhaust valve. So long as the key is held down, the compressed air holds the bellows down, but as soon as it is released, the exhaust valve is closed by its spring, the inlet valve opens, and the air rushing into the bellows inflates it again. We note here that the reason the pneumatic action is so light and elastic, is because the key has only to open this small exhaust valve, the pressure of air upon the bellows inside the box doing the actual work of opening the valves in the chest. Following the line of trackers which carry the motion from the great organ pneumatic motors, we come to this curious collection of levers, trackers, and wires, called the pneumatic couplers, which enable the organist to play any or all the manuals from the great organ key-board. Here we see five sets of levers pivoted on bars set in a frame, which are movable up and down. The front end of these five sets are on a line, one above another, and are united by a long wire, passing through them perpendicularly, each lever being kept in its proper place on the wire by leather nuts placed above and below it. To the end of this wire is attached the tracker coming from the great organ pneumatic box. When a key is held down, we see that the wire is drawn up, bringing with it, of course, the five levers through which it passes, causing a corresponding depression of the other end of the levers, to which is attached the trackers carrying the motion to the different organs. One of these sets communicate with the great or-

gan, another to the swell, a third to the choir, the fourth to the solo, and the fifth with the choir at octaves below. The bars in which these different sets of levers are pivoted, are moved in and out of action by large pneumatic motors, placed near at hand. These motors are operated by the small thumb knobs placed over the great organ key-board, which we have seen. The thumb knobs all being pushed in, and a key held down, we see that the levers all carry the motion received to the trackers running to the various wind chests. We have the great organ separation released (the first thumb knob), and we see the bar to which they are attached instantly raises, and, in consequence, the lever no longer communicates the motion it receives. The great organ key-board is therefore separated from its wind chest.

We release the second knob and find the lever connecting the swell action does not act. Again, pushing in the second knob, the bar is pushed down, and the connection again made. By this means any and all, or any combination of key-boards, can be made at will by the organist, and all played from the great organ key-board. From the pneumatic coupler the action is carried directly to the wind chests.

Besides this line of action we have been following, there is also the direct action of the swell, choir, and solo organs, all of which are carried in the same manner, except that they do not pass through the pneumatic coupler, but from the key directly to their respective pneumatic motors, and from there to the chests. Before these lines of direct action reach their pneumatics, they are met by the action from the pneumatic coupler, which is secured to them, and but one line of action for each organ goes to the chest. Returning again to the key-board we note there is a very much heavier line of action which lays close to the floor. This is from the pedal key-board, and, on account of the increased strain

upon it, is of necessity much stronger. It is carried, however, in the same manner as the key action, and passes to a set of pneumatic motors very much larger than those we have before seen, but which are constructed on the same principle. From the motors it goes directly to the wind chests of the pedal organ. The larger register of the pedal organ have separate pneumatic motors to each valve, which are placed inside the chest. Having looked over the manual and pedal action, we next turn our attention to that of the registers. There are three ways of drawing all the registers in the organ—first, by the register knobs; second, by the crescendo pedal; third, by the combination pedals. Drawing by the register knob, we will look into first. The register rod which we see at the key-board, we find reaches but a short distance inside, and has, just before its termination, an incline on its under side. Resting on the under side of this rod, we see one arm of a short lever, which, as the register is drawn, is depressed, raising the opposite arm, to which is attached the tracker carrying the motion into the organ. Following this line, we come to a set of large squares, near the floor, by which the direction is changed, and our action runs horizontally along on each side of the key action till it reaches the point of distribution, where it branches off in various directions to the pneumatic motors operating the sliders of the different organs. To move these sliders is the work of the register action, and so long as the action is drawn, so long will the pneumatic motor keep the desired set of pipes in operation, no matter at what point along this line of action the motion is given, or in what manner. Drawing the registers by the knobs enables the organist to use any particular set of pipes he may desire, or to make any special combinations of different sets he may desire, but drawing them by the crescendo pedal always draws them in the order of their strength, from the softest to the

loudest. How this is effected we will now ascertain. Looking into the key-desk we find the slide which the organist moves with his feet, when he wishes to produce the crescendo effect, is attached to a long wooden bar placed just inside the desk. Above, and on a line with this bar, is a wheel around which a cord passes. The ends of this cord are attached to the ends of the bar, so that as the slide is moved the wheel revolves, and, by a gearing, this motion is communicated to two drums, one on each side of the key-desk, on the face of which are a series of cams. The drums are directly over a series of levers having a small roller in ends that rest on the drums. To the opposite ends of these levers are attached trackers, which carry the motion to the same arm of large squares near the floor which receives the motion from the register knob. Now, as the drums revolve, the cams strike the little roller in the end of the levers, which are quietly and easily depressed, raising the opposite end of the lever in the same manner as those just behind the register rod, and with the same effect, for the square is drawn up, and thereby the motion necessary to make the register pneumatic motors is communicated to the connecting line of action, the same as if the register rod was drawn.

The third method of drawing the register is by the combination pedals. From the small iron pedals at the key-desk the motion is carried to a series of large, strong rollers, laying underneath and spanning the register action on both sides of the key action, at a point where the register action runs horizontally, close to the floor. Each one of these rollers is provided with what looks much like a comb, between the teeth of which the trackers carrying the motion to the register pneumatics pass. Each one of these rollers has a certain combination to make, and to enable it to do it, a small block is placed on the tracker just before it

passes through the comb, so that when the roller moves the tracker having the block upon it, is caught by the comb and is drawn back, while those having no blocks upon them are not affected.

For instance, we see this roller which gives the combination "Piano Great," and before its comb we find but three trackers having blocks on them, consequently only these three registers are brought into use, while the roller of the "Full Organ" pedal has, before its comb, a block upon all the trackers, and, therefore, brings all into use. The drawing back of the tracker produces the same effect as when the register knob is drawn, for it gives to the trackers carrying the motion to the pneumatic motors the necessary motion to make it act.

Having taken a survey of what there is of interest on this floor, and of the mechanism generally, we will go above and look at the tonal portion of the organ. On reaching the next story, we find ourselves on the level of the great and choir organ wind-chests, and amid a forest of pipes of all sizes, shapes, and lengths, grouped on the different wind-chests. Wide, spacious passage-ways enable us to pass round and among the pipes with ease and comfort. This is extremely important, as it enables any particular pipe or set of pipes to be reached without disturbing its neighbor; and, again, it gives ample breathing or speaking room to them.

Standing in the passage-way, between the great and choir organs, facing out into the hall, we have directly in front of us the wind-chests of the great organ. This is divided into two divisions, the second division occupying the space just in the rear of the center section of the pipes seen in the front directly over the key-boards. The first division is divided into two parts, and these are placed to the right and left of the second division, but separated from it by commodious

passage-ways, and located in the rear of the groups of large pipes seen in the projections each side of the center section.

As the wind-chests are among the most vital parts of an organ, they should receive our attention at this point. First in the course of construction is its frame, which is of sound, solid wood, neatly and strongly dovetailed together, having on the inner surface of the side pieces, a series of rabbets to receive the ends of the partitions which divide its interior into channels, of which there are sixty-one, one for each note of the key-board. The partitions having been driven and glued in, and the upper surface made perfectly true and level, the veneer is "laid" or firmly glued to the surface of both frame and partitions, forming an air-tight cover, except where it has been pierced for the air to pass to the pipes.

The space between the partitions on the under side is "filled" to the depth of about three-fourths of an inch with wood, entirely across the chest, save that portion of the channel covered by the valve.

Underneath this frame, and covering the valves, is placed the air-chamber, which receives the wind from the bellows (by means of the wind trunks), and acts as a reservoir to supply the pipes standing on the chest, as the valves may be opened.

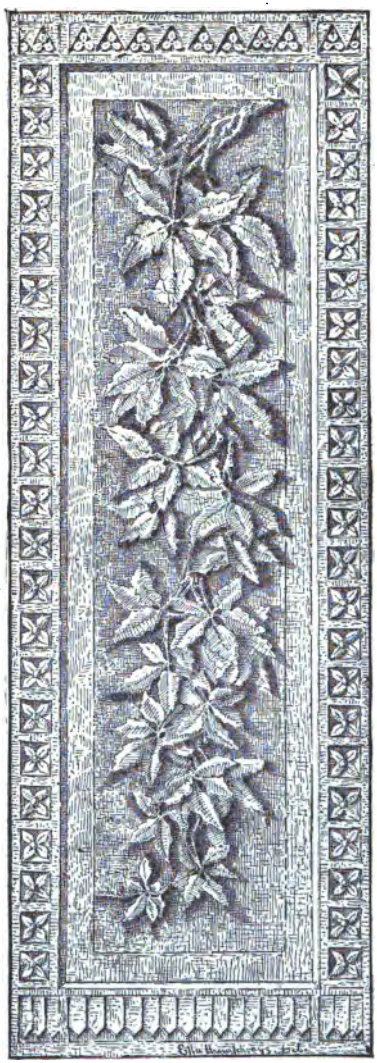
Directly under the valve is placed the spring that returns it to its place when opened, and attached to the front end is the pull-down wire. This wire passes through the "nipple-board," or under the board of the air-chamber, and to prevent sticking by the swelling of the wood on the one hand, and a waste of wind on the other, the holes through this nipple-board are made much larger than the wire, and covered by a small piece of brass, which is pierced to allow the pull-down wire to pass and allow no play. To this wire the action from the key-board is attached. Upon the

top of the veneers are placed the bolsters, which are strips of wood of the same thickness as the sliders, and upon these bolsters in turn the top-boards rest. The spaces between the various bolsters on the sides, the veneer on the bottom, and the top-board on the top, are filled by the sliders, and to allow them to move freely, and yet not allow an escape of wind, a single thickness of paper is placed on the bolster, which prevents the top-board from binding the sliders.

The sliders are pierced with holes corresponding with those in the veneer and top-boards, and so arranged as to allow it to be moved so as to bring its holes on a line with those above and below it, and thereby allow the wind to pass to the pipes, or to interpose solid wood between them, and so prevent its passage. Moving these sliders in and out of the line of the holes, above and below it, is the work of the register action.

The top-boards, upon which the pipes rest, are made of heavy plank, to withstand the weight of the pipes resting upon them, and veneered on both sides, to withstand the effects of atmospheric moisture, and any inclination to warp. Above these top-boards are the rack-boards, which hold the pipes in an upright position.

With the descriptions we have had of the construction, and what we have seen of the various parts up to this point, we are better able to understand what takes place, when the key is pressed down, to produce the tone. The motor being in operation, the bellows are inflated, and the wind distributed by the wind-trunks to the wind-chest and pneumatic boxes throughout the organ. A register being drawn—the open diapason eight feet of the great—the slider is moved by its pneumatic motor, so as to bring its holes opposite those of the veneer and top-board. We press down a key, the motion is communicated to the great pneumatic,



THE AMERICAN IVY.

which, in turn, passes it through the pneumatic coupler, and to the pull-down wire of the valve, which opening allows the wind to pass from the air-chamber, through channel, veneer, slider, and top-board to the pipe before us, and the sound is produced. But how? We will take out this pipe and examine it. This is what is called a flue-pipe, and is composed of three parts: The foot, the language, and the body. The foot is that part which rests on the top-board, supporting the pipe, and is in the form of an inverted cone, having an opening in the lower end or toe, through which it receives the wind. At its upper end we find the language —a thick, heavy piece of metal—which is fastened horizontally to it, and which prevents the air from passing into the body. Its front edge is cut to a straight edge, corresponding to the depression of the front face of the foot, called the "under-lip," and is slightly behind it, leaving an aperture for the wind to pass. Its front face is also beveled. The body is that part extending from the foot upward, and has on its front face the "upper lip." The tone is produced by the wind passing from the foot through the aperture between the under-lip and the language, and by the direction given it by the relative position of these parts to the upper-lip, impinging on it, thereby setting in vibration the column of air in the pipe. No air passes through the body of the pipe. This gives the tone, but its pitch is regulated by the length of the column of air in the pipe. To change this length, a slit is cut near the tope of the pipe, the metal being rolled up neatly at its lower edge. As this is rolled up or down, so is the column of air lengthened or shortened, as may be necessary to bring it to the desired pitch.

The tone of all pipes, whether wood or metal, is produced in a similar manner, with the exception of the reeds. Of the reeds there are two varieties—free and striking; and we take this pipe from the trumpet, 8 ft. of the great organ, to

examine one of the striking reeds. Its various parts are the foot, block, eschallotte, reed, spring, and tube or body.

The foot is a strong tube open at its upper end to receive the block, and closed at its lower end, except a small aperture to allow the wind to enter.

The block is a circular piece of solid metal, an inch or more thick, having a flange on its upper edge, and having two round holes through it, one to receive the eschallotte, and the other for the spring wire. The eschallotte is a slightly conical tube of brass, closed at its lower end, having its front face cut away, the edges being polished and burnished. Upon this surface lies the reed, a thin piece of tempered brass which entirely closes the aperture in the face of the eschalotte when pressed down on it. The reed and eschallotte are held into the block by a small wedge. The spring is a small wire, so formed as to bring a surface to bear upon the upper face of the reed, holding it closely to the eschallotte, and preventing its vibration above the point of impact. The tube or body is very small at the point where it is fastened to the block, and gradually increases in size to its upper end. It is attached to the block directly over the orifice, under which is the eschallotte. From this pipe the tone is produced by the wind impinging on the reed, bringing it down on the face of the eschallotte. Its elasticity causes it to rebound, only to be met by the wind and driven back. This sets the air in the pipe in vibration, and from the series of blows the reed delivers it takes the name of striking reed.

The free reed is so called from the fact that the reed is placed on a plate having an aperture just large enough to allow it to vibrate through it without touching. The tone so produced is smoother and more delicate than that from the striking reed.

Turning round, we have before us the choir organ, with

its divided wind-chests, separated by a wide passage-way, and between us and the passage-way are located the carillons, or bells. These consist of a series of steel bars of graduated length and thickness, arranged and supported on a sounding-board, and provided with an action similar to that used in the piano forte.

The hammers, instead of being buckskin as in the piano, are here like wooden mallets. The motive power is furnished by the solo pneumatic motors, to which this action is attached, which causes the bars to be struck a quick, sharp blow, giving the effect of bells. While this is one of the most pronounced successes ever made in this direction, we question the propriety of having such a toy form a part of such a dignified and majestic instrument.

Climbing still another story, we find ourselves on the passage-way separating the solo and swell organs. In front, the solo organ with its large scaled, solid pipes, seemingly anxious to show the dignity and power of tone they possess. This large structure behind us is the "swell-box," technically called, but looking more like a good sized tenement or house than a box.

Opening the door we enter into a large spacious room containing the 1,708 pipes of the swell organ, with the wind-chests on which they stand. The swell wind-chests are divided lengthwise into two parts, and are traversed by a passage-way covering both parts.

The "box" is a solid frame structure, firmly and thoroughly braced, and sheathed within and without, leaving an air space between the two sheathings. The front is almost entirely made up of blinds, of which there are two rows, placed perpendicularly and attached by a rod to each other. Attached to the rods of these two rows of blinds is the action from the swell pedal of the key-desk, which is so arranged that a slight motion of either toe or heel causes these

blinds to open or close as desired. When these blinds are shut, but a slight part of the tone can be heard, but as they are opened the tone gradually increases until, when fully opened, the full effect of all the pipes is obtained.

Returning again to the Hall, after our tour of observation, we feel strongly impressed with the ingenuity of construction, excellence of materials, and perfection of workmanship everywhere displayed, and while we hardly think we could, from the knowledge acquired, build a duplicate of this stupendous work, we find our stock of knowledge concerning organs has received large additions, and we are better prepared to enjoy the great feast of melody stored within its interior. E. J. K.

THE ORGAN HAS FOUR MANUALS OR KEY-BOARDS OF FIVE OCTAVES EACH, AND A PEDALE KEY-BOARD OF TWO AND A HALF OCTAVES.

The Great Organ has 22 *Complete Registers,* ~~2192~~ *Pipes.* 2282

1. *Open Diapason*, 16 feet. 61 pipes.
The larger pipes seen in the front are from this stop. Tone very broad, rich, and pervading.

2. *Quintaton*, 16 feet. 61 pipes.
Stopped wood pipes of large scale. Tone strongly harmonic, giving great fullness.

3. *Bell Open Diapason*, 8 feet. 61 pipes.
Large scaled, spotted metal pipes, having bell-shaped tops. Tone peculiarly rich, full, and sympathetic.

4. *Open Diapason*, 8 feet. 61 pipes.
Of pure tin. Tone bold, powerful, and majestic.

5. *Viola da Gamba*, 8 feet. 61 pipes.
Of pure tin. Tone strong, crisp, and very incisive.

6. *Dopple Flöte*, 8 feet. 61 pipes.
Stopped wood pipes, having two mouths to each pipe. Tone very large and full, yet brilliant.

7. *Clarabella*, 8 feet. 61 pipes.
Open wood pipes. Tone broad, mellow, and sympathetic.

8. *Gemshorn*, 8 feet. 61 pipes.
Conical pipes, of proof tin. Tone of great breadth and fullness.

9. *Viol d'Amour*, 8 feet. 61 pipes.
Conical pipes, with a bell top. Pipes of proof tin. Tone quite delicate, but reedy; very beautiful.

10. *Quint*, $5\frac{1}{3}$ feet. 61 pipes.
Cylindrical pipes of metal. Tone strong and fluty.

11. *Octave*, 4 feet. 61 pipes.
Pipes of pure tin. Tone strong and positive. The whole organ is tuned from this stop.

12. *Flute Harmonique*, 4 feet. 61 pipes.
Pipes of metal. Tone powerful, brilliant, and penetrating.

13. *Gambette*, 4 feet. 61 pipes.
Pipes of pure tin. Tone like that of No. 5, an octave higher.

14. *Twelfth*, $2\frac{2}{3}$ feet. 61 pipes.
Pipes of metal. Tone like that of No. 10, an octave higher.

15. *Fifteenth*, 2 feet. 61 pipes.
Pipes of metal. Tone like that of No. 11, an octave higher.

16. *Cornet*. 5 ranks, 269 pipes.
Pipes of metal and wood, five to each note, except in the lower octaves. Tone harmonics of the sixteen-foot tone.

17. *Mixture*. 4 ranks, 244 pipes.
Pipes of metal, four to each note. Tone harmonics of the eight-foot tone.

18. *Acuta*. 4 ranks, 244 pipes.
Pipes of metal, four to each note. Tone harmonics of the eight-foot tone.

19. *Cymbale*. 7 ranks, 394 pipes.
Pipes of metal, seven to each note. Tone bright and silvery.

20. *Bombard*, 16 feet. 61 pipes.
Pipes of spotted metal. Striking reeds of great breadth and power.

21. *Trumpet*, 8 feet. 61 pipes.
Pipes of spotted metal. Striking reeds of great power and brilliancy.

22. *Clarion*, 4 feet. 61 pipes.
Pipes of spotted metal. Tone clear and ringing.

The Swell Organ has 19 *Complete Registers,* 1708 *Pipes.*

1. *Bourdon*, 16 feet. 61 pipes.
Stopped pipes of wood. Tone quiet, but very pervading.

2. *Open Diapason*, 8 feet. 61 pipes.
Pipes of pure tin. Tone of a fine-grained, sympathetic quality.

3. *Salicional*, 8 feet. 61 pipes.
Pipes of pure tin. Tone strongly reedy and crisp.

4. *Spitzflöte*, 8 feet. 61 pipes.
Conical pipes of pure tin. Tone strong and very filling.

5. *Stopped Diapason*, 8 feet. 61 pipes.
Stopped pipes of sprucewood. Tone clear and bright.

6. *Quintadema*, 8 feet. 61 pipes.
Stopped pipes of pure tin. Tone a beautiful harmonic effect, made by the prominence of the twelfth above with the eight-foot tone.

7. *Æoline*, 8 feet. 61 pipes.
Very slender metal pipes. Tone very soft and delicate, slightly reedy. This is the softest register in the organ.

8. *Octave*, 4 feet. 61 pipes.
Pipes of pure tin. Tone strong and positive.

9. *Flauto Traverso*, 4 feet. 61 pipes.
Pipes of wood, harmonic above middle C. Tone a fine imitation of the orchestral instrument.

10. *Violina*, 4 feet. 61 pipes.
Pipes of pure tin. Tone like that of No. 3, an octave above.

11. *Nazard*, 2⅔ feet. 61 pipes.
Pipes of metal. Tone flute-like, harmonics of the eight-foot tone.

12. *Flautino*, 2 feet. 61 pipes.
Pipes of metal. Tone bright and delicate, flute tone.

13. *Mixture.* 5 ranks, 305 pipes.
Pipes of metal, five to each note. Tone harmonics of the eight-foot tone.

14. *Dolce Cornet.* 6 ranks, 366 pipes.
Pipes of metal, six to each note. Tone smooth and silvery.

15. *Contra Fagotto*, 16 feet. 61 pipes.
Pipes of spotted metal. Tone like that of the orchestral instrument.

16. *Cornopean*, 8 feet. 61 pipes.
Pipes of spotted metal. A powerful horn-toned reed.

17. *Oboe*, 8 feet. 61 pipes.
Pipes of spotted metal. Tone imitative of the orchestral instrument.

18. *Vox Humana*, 8 feet. 61 pipes.
Cylindrical pipes of pure tin, nearly closed on top. One of the most successful imitations of the human voice ever produced.

19. *Clarion*, 4 feet. 61 pipes.
Pipes of spotted metal. Tone bright, clear, and ringing.

The Choir Organ has 17 *Complete Registers*, 1281 *Pipes.*

1. *Lieblich Gedact*, 16 feet. 61 pipes.
Stopped pipes of wood. Tone very deep, quiet, and sweet.

2. *English Open Diapason*, 8 feet. 61 pipes.
Pipes of spotted metal. Tone broad, smooth, and mellow.

3. *Geigen Principal*, 8 feet. 61 pipes.
Pipes of proof tin. Tone strong and string-toned.

4. *Viola*, 8 feet. 61 pipes.
Pipes of spotted metal. Tone rather delicate and reedy.

5. *Rohr Flöte*, 8 feet. 61 pipes.
Pipes of wood and metal. Tone very full and thick.

6. *Melodia*, 8 feet. 61 pipes.
Pipes of wood. Tone round, rich, and mellow.

7. *Dulciana*, 8 feet. 61 pipes.
Pipes of metal. Tone sweet, quiet, and delicate.

8. *Octave*, 4 feet. 61 pipes.
Pipes of spotted metal. Tone broad, strong, and clear.

9. *Fugara*, 4 feet. 61 pipes.
Pipes of proof tin. Tone strongly string-toned and bright.

10. *Violin*, 4 feet. 61 pipes.
Pipes of pure tin. Tone like that of No. 3, an octave above.

11. *Flute Octaviante*, 4 feet. 61 pipes.
Pipes of metal. Tone bright, clear, and liquid.

12. *Quintflöte*, $2\frac{2}{3}$ feet. 61 pipes.
Pipes of metal. Tone a flute-toned harmonic of the eight-foot tone.

13. *Piccolo*, 2 feet. 61 pipes.
Pipes of metal. Tone clear and penetrating.

14. *Cornet.* 5 ranks, 305 pipes.
Pipes of metal. Tone harmonics of the eight-foot tone.

15. *Cor Anglais*, 16 feet. 61 pipes.
Pipes of spotted metal. A most beautiful horn-toned reed.

16. *Clarinet*, 8 feet. 61 pipes.
Pipes of spotted metal. A fine imitation of the orchestral instrument.

17. *Vox Angelica*, 8 feet. 61 pipes.
Pipes of spotted metal. Free reeds of singularly sweet tone.

The Solo Organ has 7 Registers, 366 Pipes, and 32 Bells.

1. *Stentorphon*, 8 feet. 61 pipes.
Pipes of spotted metal, very large scale and very heavy. Tone very powerful, broad, rich, and majestic.

2. *Keraulophon*, 8 feet. 61 pipes.
Pipes of pure tin. Tone string-toned and crisp.

3. *Philomela*, 8 feet. 61 pipes.
Open pipes of wood, having two mouths. Tone full, rich, and mellow.

4. *Hohlpfeiffe*, 4 feet. 61 pipes.
Pipes of wood. Tone bright, pervading, and brilliant.

5. *Piccolo Harmonique*, 2 feet. 61 pipes.
Pipes of metal. Tone clear and ringing.

6. *Tuba Mirabilis*, 8 feet. 61 pipes.
Pipes of spotted metal. A very powerful, pungent reed.

7. *Carillons*, 4-foot tone, 32 notes.
Steel bars, giving the effect of bells.

The Pedal Organ has 16 Complete Registers, 600 Pipes.

1. *Open Diapason*, 32 feet. 30 pipes.
Open pipes of wood. The largest pipes in the organ. Six of the largest pipes of this stop are seen on the wings. Tone of great power and dignity.

2. *Open Diapason*, 16 feet. 30 pipes.
Open pipes of wood. Tone positive, powerful, and grand.

3. *Violone*, 16 feet. 30 pipes.
Open pipes of wood. Tone a remarkable imitation of the contra basso of the orchestra.

4. *Dulciana*, 16 feet. 30 pipes.
Open pipes of metal. Tone soft, but very pervading.

5. *Bourdon*, 16 feet. 30 pipes.
Stopped pipes of wood. Full, deep, and pervading.

6. *Quint*, 10⅔ feet. 30 pipes.
Stopped pipes of wood. Tone harmonics of thirty-two-foot tone.

7. *Bell Gamba*, 8 feet. 30 pipes.
Conical metal pipes, with a bell top. Tone string-like and positive.

8. *Octave*, 8 feet. 30 pipes.
Open wood pipes. Tone like that of No. 2, an octave above.

9. *Violoncello*, 8 feet. 30 pipes.
Open pipes of proof tin. Tone like that of No. 3, an octave higher.

10. *Flöte*, 8 feet. 30 pipes.
Open pipes of wood. Tone sweet and mellow.

11. *Super Octave*, 4 feet. 30 pipes.
Pipes of proof tin. Tone brilliant and lively.

12. *Cornet.* 5 ranks, 150 pipes.
Pipes of metal. Tone bright and piquant.

13. *Contra Bombard*, 32 feet. 30 pipes.
Pipes of wood. A free reed of great power, and volume in unison with No. 1. Its vibrations are so slow as to be distinctly felt.

14. *Trombone*, 16 feet. 30 pipes.
Pipes of wood. Striking reeds of a very telling character.

15. *Posanne*, 8 feet. 30 pipes.
Pipes of spotted metal. Tone bold, bright, and very positive.

16. *Clarion*, 4 feet. 30 pipes.
Pipes of spotted metal. Tone clear and ringing.

There are 15 Mechanical Registers.

1. *Great Organ Separation.*
2. *Swell to Great Coupler.*
3. *Solo to Great Coupler.*
4. *Choir to Great Coupler, unison.*
5. *Choir to Great Coupler, sub-octave.*
These couplers are operated by pneumatic power, and controlled by thumb-knobs placed over the great organ key-board.
6. *Pedale Combination, separation.*
Detaching or adding pedale registers to the combination pedals. Operated by a thumb-knob over the swell key-board.
7. *Swell to Choir Coupler.*
8. *Great to Pedale Coupler.*
9. *Swell to Pedale Coupler.*
10. *Choir to Pedale Coupler.*
11. *Solo to Pedale Coupler.*

12. *Octave Coupler Solo.*
13. *Swell Tremolo.* Also operated by pedal.
14. *Choir Tremolo.* " " "
15. *Bellows Signal.*

There are 14 Pedal Movements.

1. *Grand Crescendo Pedal.*
   Covering the whole organ; bringing on the registers as slowly or as rapidly as the organist desires, commencing with the softest, and diminishing in the reverse order. The dial over the manuales shows its position at all times.
2. *Full Organ Pedal.*
   Drawing the whole organ with couplers instantly.
3. *Forte Combination Great.*
   Drawing the full great and an appropriate pedale.
4. *Mezzo Combination Great.*
   Drawing the eight-foot and four-foot registers of the great, with an appropriate pedale.
5. *Piano Combination Great.*
   Drawing Nos. 5 and 6 great, and an appropriate pedale.
6. *Forte Combination Swell.*
   Drawing the full swell, with an appropriate pedale.
7. *Mezzo Combination Swell.*
   Drawing a medium combination of swell registers, with pedale.
8. *Piano Combination Swell.*
   Drawing Nos. 3 and 5 swell, and an appropriate pedale.
9. *Forte Combination Choir.*
   Drawing the full choir, and an appropriate pedale.
10. *Piano Combination Choir.*
    Drawing Nos. 6 and 7 choir, and an appropriate pedale.
11. *Reversible Pedal.*
    Operating great to pedale coupler.
12. *Swell Tremolo.*
13. *Choir Tremolo.*
14. *Balance Swell Pedal.*

The above movements are all double-acting, and do their work without affecting the register knobs.

Pneumatic levers (exhaust) are applied to the four manuales independently; to the mechanical registers, Nos. 1 to 6, and No. 11; to the pedale and register action throughout.

Summary.

Great Organ,	22 Registers,	2282 Pipes.	
Swell Organ,	19 "	1708 "	
Choir Organ,	17 "	1281 "	
Solo Organ,	7 "	366 "	32 Bells.
Pedale,	16 "	600 "	
Mec'nical Registers,	15 "		
	96 Registers,	6237 Pipes,	32 B'ls, 14 P'd'l Mov'ts

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OF THE

MUSIC HALL ORGAN ASSOCIATION.

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Secretary.

A. HOWARD HINKLE.

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CHAPTER VIII.

THE MUSIC HALL.

The importance of this superb building to the æsthetical culture and commercial prosperity of the city of Cincinnati, may not easily be estimated. The large hall, with its superior acoustics, its excellent ventilation, numerous and comfortable seats, safe and commodious means of ingress and egress, gives the opportunity of supplying the masses of the people with entertainments of a pleasant and instructive character at low prices. When a well-known impresario saw the hall, he became very enthusiastic, and exclaimed: "This is the one thing I have always wanted in the United States. When I bring a great artist—Adelina Patti—to this country, other cities must pay $3.00 or $5.00 to hear her. Here it will cost only fifty cents."

And so with lectures, sermons, concerts, and many other entertainments. The capacity of the hall is so great that the prices of admission may be placed at a low rate.

From a commercial point of view, the value of this great edifice will at once be recognized. Here will be held annual expositions, representing the progress and prosperity of the arts and trades of the whole country. Here will gather political, religious, scientific, and other conventions, bringing together the active, wise, and influential men of all the land Such a hall was a necessity in Cincinnati. The position of the city upon the banks of a great river, whose commerce is imperial in magnitude; the center of many converging lines of railroad; surrounded in every direction by

great forests of valuable timber, mines inexhaustible with metals and minerals; the nearest market of an agricultural production unequaled in the world:—all of these advantages render the existence of a great hall, where thousands of men and women can meet together, of inestimable value.

These were the considerations which induced the noble gift of Mr. Springer, and the popular contribution in support of his donation. It was a most thoughtful gift; unusual, as it was practical, useful, and democratic. In the same spirit of patriotism and generous emulation with which the fund was given, has the building been planned and completed. The board of trustees, contractors, and workmen have performed their labors as if it were a pride and honor to be associated in the construction of this noble temple. They seemed to feel it was the gift of the people to the people. It was considered necessary to complete the building in time for the Musical Festival held during the middle of May, 1878. There were only some twelve months for this work. The task was full of difficulties. Delays of all kinds interfered to prevent the successful accomplishment of the undertaking, but the obstructions were overcome, and the imposing edifice stands completed.

In all the labor and onerous responsibility of this great achievement, it is a pleasure to say that the chairman of the building committee stood prominent. His singular integrity of purpose and act, his patience and determination, his large knowledge and excellent judgment, made the building what it is, and rendered it possible to dedicate it in May, 1878.

The Cincinnati Music Hall Association has built the Music Hall. This association consists of fifty stockholders, who elect seven trustees. These trustees form an executive board, with absolute authority to build the hall, and afterward to manage its affairs.

The fifty shareholders, who were elected by the subscribers to the fund, are:

R. R. Springer,
Joseph Longworth,
John Shillito,
Robert Mitchell,
Alfred Gaither,
Henry Mack,
L. B. Harrison,
Geo. W. McAlpin,
William Gibson,
A. H. Bugher,
W. S. Munson,
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John L. Stettinius,
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John Carlisle,
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A. Erkenbrecher,
Wm. H. Harrison,
J. J. Henderson,
Robert Allison,
Wm. Means,
W. W. Taylor,
Marcus Fechheimer,
James Gilmore,
A. D. Bullock,
Charles W. West,
Kenner Garrard,
Herman Goepper,
John W. Herron,
Theodore Stanwood,
Carl A. G. Adae,
T. D. Lincoln,
H. Wilson Brown,
John Church, Jr.
M. F. Force,
Geo. K. Shoenberger,
Benj. F. Evans,
Chas. P. Cassilly,
Geo. Ward Nichols,
Thomas Gilpin,
John R. Wright,
Josiah Kirby.

The following gentlemen were elected:

TRUSTEES.

President.

JOSEPH LONGWORTH, *for six years.*

Treasurer.

JOHN SHILLITO, *for seven years.*

Secretary.

JULIUS DEXTER, *for four years.*

T. D. LINCOLN, *for five years.*
W. H. HARRISON, *for three years.*
ROBT. MITCHELL, *for two years.*
R. R. SPRINGER, *for one year.*

BUILDING COMMITTEE.

JULIUS DEXTER, *Chairman.*
JOSEPH LONGWORTH.
A. T. GOSHORN.

Architects of the Hall—Messrs. Hannaford & Proctor.
John McCammon, Superintendent of the work.
Most of the contracts were awarded April 28, 1877, to—.
Bricklaying—W. A. Megrue.
Cut stone—Isaac Graveson.
Iron—Snead & Co.
Slating, etc.—James Hunter & Co.
Gas-fitting and plumbing—James Allison.
Carpenter-work—James Griffith & Sons.

The ground upon which the building stands is donated by the municipality of Cincinnati.

The cost of the building has been about $307,000.

DESCRIPTION OF THE HALL.

The exterior of the Hall presents an imposing appearance. The style of architecture is a modified, modernized Gothic; the material black, colored, pressed, and other brick, with sunken joints. The ornaments are of stone, tile, and colored brick. The front on Elm street is 178 feet four inches in width. The depth of the buildings from Elm street to Plum is 293 feet. The highest point of the pile will be the pinnacle of the front gable of the Music Hall, which is 150 feet above the sidewalk. Two towers, with pointed roofs, stand at each corner of the Elm street front of the building, finely relieving the large rose window which is situated in the upper part of the center of the facade. The principal adornment of this facade, and, indeed, of the entire exterior of this handsome edifice, is made by the artistic and architectural use of brick. Yellow and black mortar and black brick are happily and generously introduced, giving pleasing contrasts with the prevailing tint of red. But the constructive use of this material is most noteworthy where it forms the cornice and various other points of support, instead of the unsightly, inappropriate employment of zinc and other material.

THE VESTIBULE.

The builders of the Music Hall have not forgotten that some respect should be paid to architectural effect, as well as to considerations of mere utility. The spacious vestibule, with its wide entrances, its extended gallery, its graceful pillars, its floor of colored tiles, all of these attractions greet the visitor as he enters the building. This vestibule is 112 feet long, 46 wide, and 41 high, with wide door-ways leading into the main hall.

THE CORRIDORS.

From the vestibule wide passage-ways lead to the spacious corridors, which are 18 feet wide, and traverse the entire length of both sides the building. There are two stories of these corridors—one with many doors, giving entrance to the main floor of the hall. and another, immediately above, giving access to the first gallery. These corridors are brilliantly lighted by night and day. They not only afford the means of rapid exit, but they are a delightful promenade during intermission at concerts, or upon occasions of fairs, expositions, or other entertainments.

THE SMALL HALL.

Over the vestibule is the small hall, which measures 112 feet long, 46 wide, and 30 high. It is prettily shaped, and with the commodious adjoining rooms will be often used for conventions and public meetings.

THE MAIN HALL.

Without question, this is the finest hall in this country, if not in the world. It is 192 feet long, 112 wide, and 70 high. The stage is of generous dimensions. It will receive a chorus of 700 singers, and an orchestra of over 100 musicians.

The Hall at once impresses the beholder with its large size and harmonious proportions. But an extremely novel sensation is produced by the wood lining. The walls, ceiling, and floor are made of wood, and the impression is vividly produced that you are standing inside a large musical instrument. The color of this wood (the tulip tree) is an exquisite tint of green and gold, which is its natural color when it has been well oiled.

The Hall seats some 4,428 persons. Of these seats 2,974

are on the main floor; 1,022 in the first gallery, and about 432 in the second gallery. There are five aisles; three in the body of the house, and one on each side. All the arrangements for seating are carefully made with regard to seeing and hearing the performance, and with a view to safe and easy ways of ingress and egress.

HEAT AND VENTILATION.

The building is heated by steam from four tubular boilers. Ventilation is amply provided. There are three systems of foul air ducts. The first of these is concealed behind the curves at the back of the stage on the sides of the organ, and consists of four ducts, two on each side. These respectively drain the stage and the laboratories. These ducts meet at the top of the building, and reach the open air through the rear turret. The second system is the main one. The floor of the main hall is perforated with many thousand small holes, which conduct the heavy air downward into a foul air duct about ten feet high and sixteen feet wide, in the cellar, which leads by two branches at its eastern end, into shafts which rise behind the curves at the front of the Hall. The galleries are also used as foul air conduits. The foul air enters these conducts through the perforated risers of the seat platforms, and is conducted by separate shafts to the general outlet. The front water-closet by third ducts on each side, concealed as the others behind the curves at the front of the main hall, are drained in like manner to a large shaft in the attic over the small hall, which serves as the general outlet to this system. This shaft drains also the small hall through radiators over its chandeliers. This outlet rises close to the middle of the wall between the vestibule and the large hall, and when it reaches within a few feet of the ridge pole of the roof, extends by a sharp slope underneath it to the front of

the building, forming a trough about five feet wide and above forty feet long, which is open to the sky. Rain and snow falling into it are carried off by a pipe at the point where the upright shaft enters the trough, and are discharged on to the roof of the main hall. The trough and shaft are lined with tin, so as to be water-tight. A curved lip to the slate roof on each side of the ridge pole, where the trough begins, prevents its being seen from the street, and gives to the roof the appearance of finish to the top. At the bottom of every foul air duct is a steam coil connected with the boilers, to assist, if required, in producing a draft.

From the ceiling of the main hall the third system is built. Thirteen large ducts rise from above the same number of gas reflectors, and unite in the three turrets above the body of the main hall. All the ceiling panels have two cracks running entirely around them, through which fresh air is admitted to the hall below. A fan, ten feet in diameter, will be driven by power applied from the steam boiler below, to create a current of fresh air, if needed.

The water closets have additional ventilation through flues running up within the walls direct to the roof.

The whole system of ventilation is meant to supplement ventilation afforded directly from doors and windows, and the radiators are therefore placed, wherever possible, directly under the windows, so that, even in winter, the draft from an open window may not be injurious or unpleasant.

THE CINCINNATI ORGAN.